Amateur Radio

Volume 81
Number 9
September 2013
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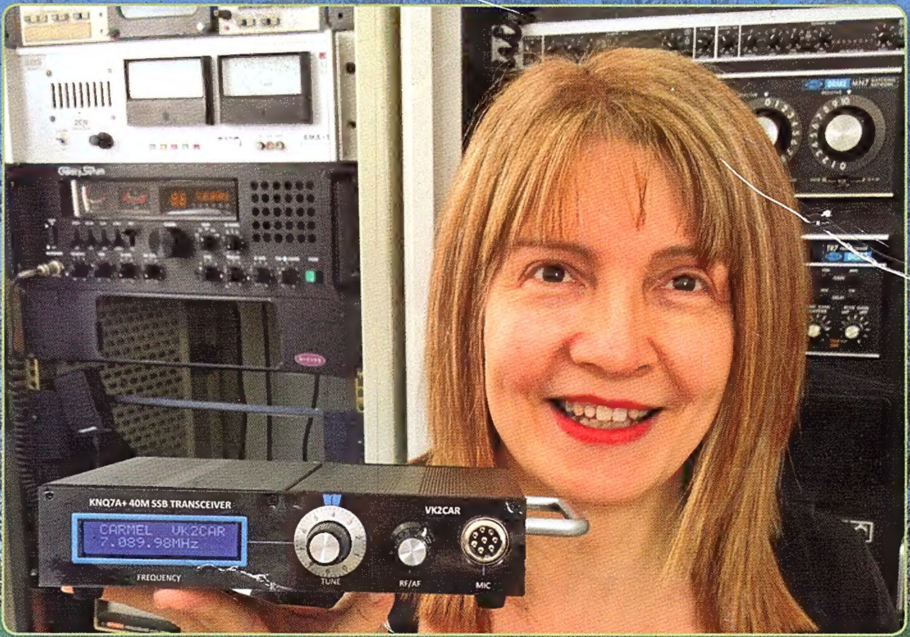
WIRELESS INSTITUTE OF AUSTRALIA

WICEN assists in Blue Mountains search

A dipole story

AR88 capacitor rebuild



A fun project: 40 m QRP SSB transceiver

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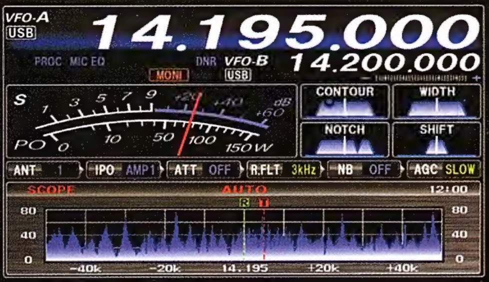
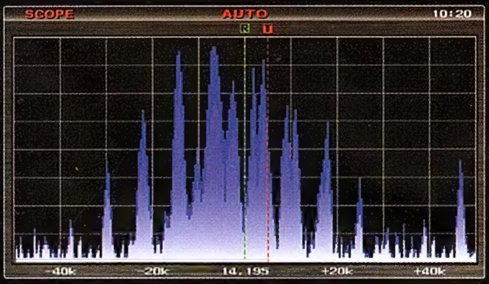


The Full Color 4.3 inch TFT display



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This month's cover

Main photo: The WICEN Communications Trailer attached to the rear of the tow vehicle, set up for the recent Blue Mountains search. See the story starting on page 21. Photo by Compton Allen VK2HRX. Inset photo: Carmel VK2CAR with her new toy – the KNQ7A 40 metre SSB transceiver. Read all about this kit project on page 6. Photo by Carmel Morris VK2CAR.

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Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are welcome and will be considered for publication. Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editorial

Peter Freeman VK3PF

Frequency usage

In early August, the WIA News broadcast included an item titled: *The contesters versus the others*. It seems to have stirred up a storm! The item was also published on the WIA website at the end of July.

I do not see why some amateurs became upset at the content, which was basically pointing out that no one individual or group can lay claim to a particular frequency and that we all need to work cooperatively on air. It also made reference to some past instances where an over eager contester may have forgotten simple courtesy and tried to bully non-contest operators into making a contest exchange with the contester.

The context of this piece was in the lead up to the weekend of the Remembrance Day Contest, which this year again fell on the same weekend as the International Lighthouse Lightship Weekend.

In my view, the issues raised by the author were completely valid ones. No single person or group "owns" a particular frequency. Certainly, if a contact is taking place on a given frequency, then the participants in that contact have first claim to the frequency at that time.

It comes down to basic courtesy – we should operate as we have all been trained: First listen carefully on a frequency for a reasonable time before hitting the PTT button (or starting to key the transceiver). Only if the frequency seems to be clear, then one should politely announce your callsign and ask "*Is this frequency in use?*", perhaps more than once. There may be someone operating QRP that you cannot hear. If that is the case, then another operator is likely to let you know of the situation. Only then can you start to call on that frequency. Yes, sometimes we all forget..... I did it myself recently when activating a SOTA summit – I had been listening for several minutes on a frequency as I finished assembling the portable station after having climbed to the top of the hill, so I was fairly sure it was clear when I grabbed the microphone and started calling CQ, then I remembered! I quickly asked the question.... No response, so I was safe, and went back to calling CQ SOTA. Then the pile up of Chasers started!

Although it is not in our VK band plan, 7.090 MHz is recognised around the world as a centre of activity frequency for QRP voice operators. Locally, it has become the centre of activity frequency for SOTA; so on weekends there are often QRP and SOTA (usually QRP) operators calling on that frequency or nearby. It can become crowded in the segment 7.080-7.100 MHz, especially if there are several SOTA activators out at a given time.

A long established net usually commences mid-afternoon on a Saturday on 7.090 MHz. This is not usually a problem. I have frequently heard the net control station come up during a break to announce that the net will move nearby, having heard the existing traffic on the frequency. Occasionally the net does move nearby, but often the SOTA operator comes back to indicate that he will QSY to allow

Continued on page 5

WIA comment

Phil Wait VK2ASD

High Power Trial Disappoints

By the time this President's Comment is read, the High Power Trial will have ceased and the output power limit available to Advanced licensees will be back to 400 watts PEP for SSB and 120 watts for all other modes. So, what went wrong? Why didn't the ACMA see fit to at least extend the trial with a view to making the higher power limit a permanent feature? What are our options now?

Let's not spin the issue; rather, I'll call a 'spade' a 'spade'.

The ACMA reached its decision following an assessment carried out on 90 of the 297 advanced licensees holding high power permits. The ACMA collected data in a number of areas: a desk-based audit of knowledge of and compliance with electromagnetic energy ("EME") requirements; site visits; complaints of interference; impact on other radio communications services; and an examination of other countries' regulatory arrangements.

According to the ACMA, from the evidence obtained a decision was made about the "benefits and risks of permanently implementing regulatory arrangements for higher power" and, at the end of the day, their conclusion was that the 'risks' outweighed the 'benefits'.

Their major concern was that the assessments demonstrated a significant lack of understanding of, and compliance with, the electromagnetic energy EME/EMR requirements within the Amateur Licence Conditions Determination (the LCD):

"during the desk-based audit... the responses received from some Advanced Licensees did not meet expectations. The responses raised doubts as to some Advanced Licensees' awareness of ongoing licence obligations and electromagnetic energy requirements..... and in some instances, the ACMA received no response to its letter in the statutory timeframe".

Clearly, a disappointment to everyone.

Additionally, the 297 amateurs who applied for the high power permit was a fairly small number compared to the total Advanced licensee population of 10,690. Also, the WIA submission to the ACMA earlier this year contained a limited number of contributions from trial participants (and I must say we were also disappointed at the response to our call for comments). That said it could not be reasonably expected that a large number of Advanced licensees would commit to the necessary investment to assemble a high power station, given there was no certainty as to the outcome of the trial.

The ACMA also said that the results of the trial demonstrated there is a need to raise awareness among all amateur licensees of their licence conditions, in other words, EME/EMR issues should be of greater concern to all radio amateurs, no matter what licence grade and power they are running.

Significant interference issues due to use of the higher power, either on the amateur bands or to other services, were not evident.

A summary of the ACMA assessment results can be found on their website at *www.acma.gov.au/Industry/Spectrum/Acquire-a-licence/Apparatus-licences/trial-of-higher-transmitter-output-power-for-licensees-i-acma*

It is important to realize that radio amateurs are not being singled out here. Compliance with electromagnetic energy requirements applies to *all* apparatus licensees, including broadcasting, maritime services and others. It's also important to realize that electromagnetic radiation is not just a technical issue, it's an emotive and political issue within the community, and we all need to be very mindful of that fact.

The trial also highlighted ambiguities and inaccuracies in ACMA material, and the lack of information provided about the assessment criteria, which we believe also had a detrimental effect on the outcome.

Some may wonder why other countries' administrations (USA, NZ etc) don't seem to have any concerns about having a higher power limit for radio amateurs. The answer goes to the various legislative and regulatory arrangements present in those countries, and when administrations do not have EME/EMR regulation within their policy charter, they are less constrained.

So, what now? Firstly, at the Institute's request, the ACMA has indicated that this issue is not closed, and the WIA intends to re-open negotiations with the ACMA, hopefully in about one year, if the amateur community can demonstrate a general increase

Continued on page 5

WIA news

4th APT (Asia Pacific Telecommunity) Workshop on Disaster Management & Communications

Chairman of IARU Region 3 Mr Gopal Madhavan, VU2GMN, along with Ramon Anquilan DU1UGZ of PARA (Philippines Amateur Radio Association) attended and delivered a presentation to the 4th APT (Asia Pacific Telecommunity) Workshop on Disaster Management & Communications in Pasay City, Philippines on 23-25 July.

Many questions were asked of the presenters and informed responses provided.

The APT appreciated the high quality of the presentation on Amateur Radio Emergency Communications and acknowledged the presentation was very well received by the delegates and added good value to the content of the workshop.

APT further requested the continued support and expertise of the Amateur Radio community, through the IARU R3 in future APT work programmes.

The Workshop was sponsored by the Department of Science and Technology and the presence of the IARU was specially mentioned during the opening ceremony. The ITU were also present at the Conference.

There were a variety of presentations covering topics such as forecasting impending disasters, warning systems using SMS to mobiles etc.

IARU Region 3 appreciated the opportunity to contribute to the further understanding of the wider community, the role that Amateur Radio can play in providing communications during major disruptions to citizens, in times of disasters.

The 3rd World ATV QSO Party

An Amateur Television QSO Party was held via the Melbourne-Geelong repeater VK3RTV and many other Australian & USA repeaters, hopefully European involvement with British Amateur Television Club streaming plus the use of Skype.

The concept, initiated by Peter Cossins VK3BFG for the Amateur Radio Victoria centenary in 2011 has been a growing annual event since. This year it was on Friday 20th from 8 pm to Saturday 31st August 10 am - the days and scheduling all in Australian Eastern Standard Time.

As we go to press, it is expected to that Melbourne's Eastern and Mountain District Radio Club will be a contributor. The Club acknowledges that its digital television project is funded through the WIA Club Grants Scheme.

Peter VK3BFG said Friday will be the time for Australia and possibly Europeans, the locals are then joined by those ATVers in the USA, with remote stations anywhere using Skype. The Digital ATV QSO Party transmissions are relatively short, often in a show-and-tell format to explain personal involvement in the visual medium.

The contesters versus the others

On many weekends, somewhere in the world, there is a contest with those involved gathering numbers or exchanges busily engaged in that activity.

Contests are very much a part of amateur radio, helping to improve rapid-fire operation, the overall skill level, station performance, scoring or to get new stations in the log. One thing a contester should not do is deliberately break into any non-contest QSO and demand that stations give them an exchange or number. This is particularly true when a clash occurs, like this month, which has both the WIA Remembrance Day Contest and the International Lighthouse and Lightship Weekend.

In most instances lighthouses are happy to give out contest numbers and generally one activity helps the other, however there are a few who don't conform to this accepted practice.

The rules of radio etiquette are that no-one, nor an activity, owns a frequency or band. Care is recommended, particularly on 80 metres on the Saturday night when the local lighthouses try to contact each other. Contesters, in avoiding interference, are also mindful that they share the bands with low power portable stations.

New frequencies for wireless microphones

Radio clubs are advised that a large number of wireless radio microphones currently operating under a Class Licence using frequencies between the analogue TV broadcasting channels (520-820 MHz), will soon become illegal as the analogue TV frequencies are phased out this year.

An estimated 150,000 wireless radio microphones in use by churches, schools, entertainment venues, fitness instructors, tourism operators and community groups will be affected.

Now is the time for radio clubs and others to check their equipment because 694 MHz to 820 MHz will be withdrawn to provide the so-called "digital dividend" of spectrum made possible with an end of analogue TV in Australia.

Those radio clubs who own wireless microphones used for presentations are encouraged by the WIA to check the operating frequency of their equipment to ensure it remains compliant with the upcoming frequency re-allocation.

For more information check with your supplier or the ACMA at: *http://www.acma.gov.au/Industry/Suppliers/A-Type-of-equipment/Wireless-microphones*

WIA comment

Continued from page 3

in EME/EMR awareness and compliance. Secondly, the WIA intends to do whatever it can to increase awareness within amateur radio circles of the EME/EMR compliance issues. The ACMA has indicated it looks forward to working with the WIA to achieve that objective, and is also working to improve their published material and other issues highlighted during the trial.

As I said, this is a disappointing outcome. The trial was initiated by Michael Owen VK3KI and has since taken a lot of work from a very few people. I would like to thank the following members of the Spectrum Strategy Committee for their diligent work over the course of the High Power Trial: Peter Young VK3MV, Doug McArthur VK3UM, Noel Higgins VK3NH and Roger Harrison VK2ZRH.

Phil Wait VK2ASD
President, WIA

Editorial

Continued from page 2

the net to start and continue on the regular frequency. It is pleasing to listen to the friendly exchange and cooperative attitudes on both sides.

On the other hand, I often hear unidentified stations simply tuning up on top of the existing activity, or even worse, playing odd sounds or music on air. Clearly, we should all recognise that such behaviour is unacceptable and in breach of the LCD.

In my opinion, there is only one situation when someone owns a frequency: when there is an emergency occurring, with a frequency being used to pass emergency traffic. The frequency may not be actively used at all times, but under such circumstances it is entirely reasonable for one or more of the operators to request that the frequency be left clear.

So what is my take home message?

I recommend that we all try to maintain a clear head and a calm attitude at all times. If someone is making it difficult by their actions, it is always easier to simply ignore them, attempt to find a clear frequency and then QSY to the new frequency.

Life is too short to do otherwise! Becoming agitated does not help anyone; it simply increases your stress levels.

Cheers,

Peter VK3PF

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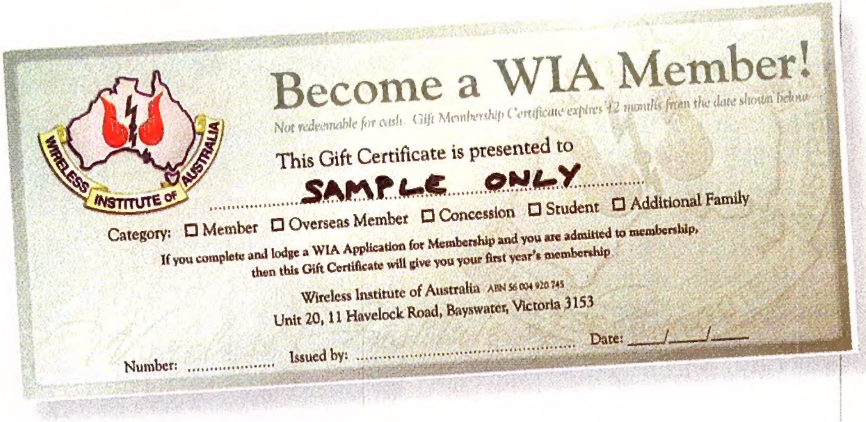

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Another fun QRP project - KNQ7A+ 40 metre LSB transceiver

Carmel Morris VK2CAR

Photo 1: Here is the straight KNQ7A kit assembled.

These days there seems to be a plethora of QRP kits available for CW, SSB and SDR fans. From Hendricks to Elecraft (including Softrock and the Oz-QRP DDS kit), a friend put me onto this simple, low cost, 40 metre kit which is ideal for portable operation. This is the KNQ7A, a LSB transceiver for low power operations, and boasting up to 10 watts on 13.8 V. Designed by Ke Shi BA6BF, it is a compact radio that uses the chassis as a heatsink for the relevant components such as the PA. Crystal options are available from the kit supplier, *crkits.com*, for you to choose your 20 kHz bandwidth on the 40 metre band. Choose an 8.467 MHz IF for frequencies below 7.100, or 8.192 MHz for frequencies above 7.100. The radio can actually have a wider bandwidth but it is not recommended due to drift. Some modifications can be found online to get around this. The radio requires an external power supply and speaker.

The heart of the radio is two NE602 double-balanced mixed oscillators for RF and audio, as through-hole components. I did away with relying on an external speaker and wired up a speaker microphone instead. I also replaced the SO239 with a BNC socket as all the other QRP gear in the shack has BNC, including my Elecraft T1 latching relay tuner. Rod, my OM, made up a metal bung for the SO239 hole that was there, so I didn't have to cut a new rear panel. For more precise VFO tuning, some folks put in a 10-turn pot. I had one in my parts box but it was too big. I found the 10k tuning pot that came with the kit acceptable.

I made some interstate contacts and received good audio and signal reports. I then decided to add a separate module in an identical case, to hold a battery pack and a frequency counter (just for fun). The counter PCB was 2 mm too high with tracks up to the edge, and the lid of the case would not sit snug, so I had to position the counter board at an angle, using pin header extenders (stolen from an earlier Arduino project) and bent to an appropriate angle. I probably should have created a new powder-coated lid, but I was too cheap to do so this time. It's very easy for project builders to blow out the budget with feature creep.

There are a few compact counter kits available. I had a larger

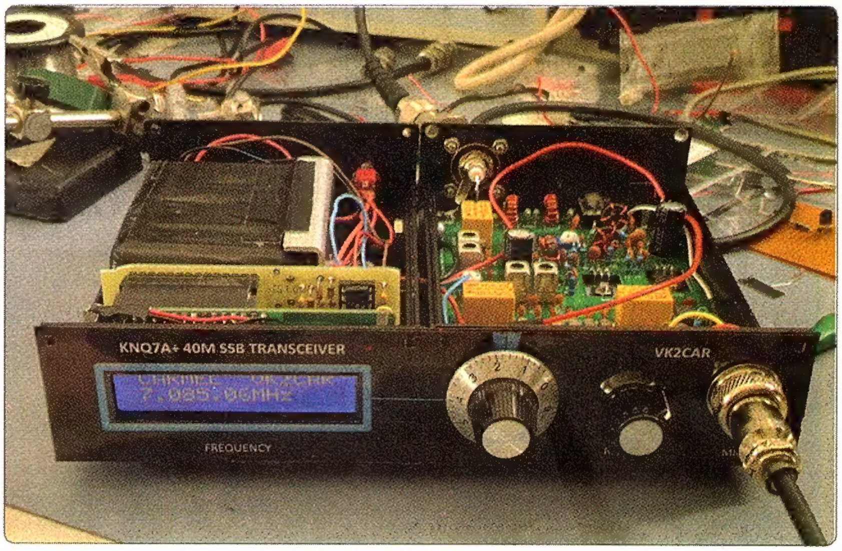

Photo 2: Here's the front showing the counter.

one in my junk box with the required IF offset to calibrate. Typical counters have the 16F628A PIC, so an offset can be programmed into the PIC, either negative or positive. Coupled with a 10 pF ceramic, I was able to tap the NE602, pin 7 oscillator-emitter and run a short wire to the counter signal input. In order to get the jumper from under the PCB, I had to nibble the edge of the PCB to feed the wire through. Some frequency counters are less sensitive and require a buffer and I experimented with these on Veroboard for another meter, but adding an internal battery too, space was at a premium. I found an inexpensive, sensitive counter on eBay. Some amateur suppliers sell counters with 10-turn pots on the PCB for coarse and fine calibration, so in most cases reprogramming the PIC is not necessary. After installing the counter, minor alignment was necessary (using the free download 'Spectrum 3' by Con ZL2AFP), with everything well-grounded there wasn't any multiplexing noise either.

In the second module I included rechargeable batteries, and binding posts for the batteries to be charged up via my smart charger (or to add a supplemental battery in the field). The long flat 10 x AA battery trays sold by Jaycar were too long for the case, so I purchased a two-row 6 x AA and a 4 x AA holder and kludged them together. I could not find any 2 x 5 row holders, and could not find heatshrink in my parts drawer that was big enough, so just used gaffer tape to string them together, which serves for now. Finally, I designed a new front panel and it all fits together nicely. I have since made good contacts from VK2 to various states including VK6 and one ZL, using my portable OCF 'clothes line' antenna. Not bad for a few watts.

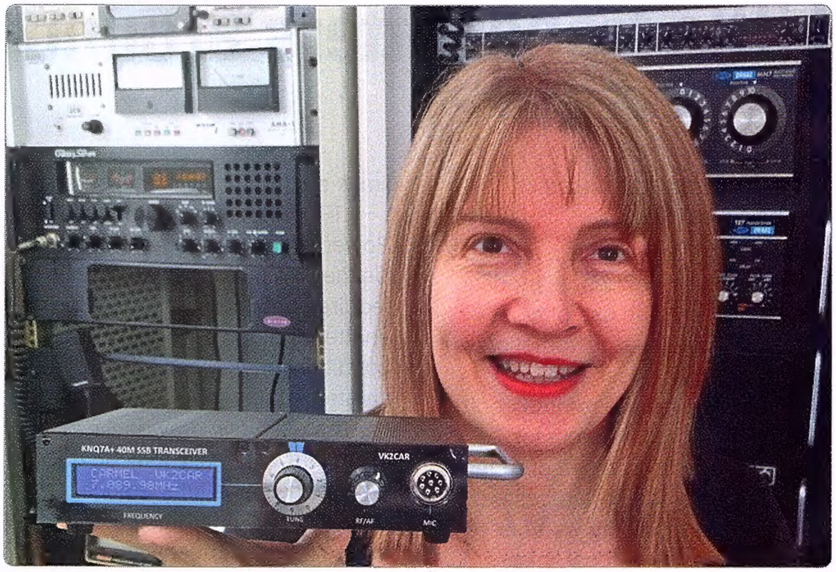

Photo 4: The author, Carmel VK2CAR, with her new toy.

What next? A sleep mode would be good for the backlight, or just a switch, or maybe replace with a low-draw OLED display. DDS would be the next improvement, but I'd have to save up some pennies first. Of course the Oz QRP kit covers the full 40 metre or 80 metre band and maybe that will be the next project. If I had time, I'd design something from scratch, but one is lucky if one has that kind of time. For this exercise, I just wanted to see a cool little radio with a display, have internal power, and still be compact and low-cost. Doing these homebrew extras is probably trivial for some folk, but still a lot of fun.

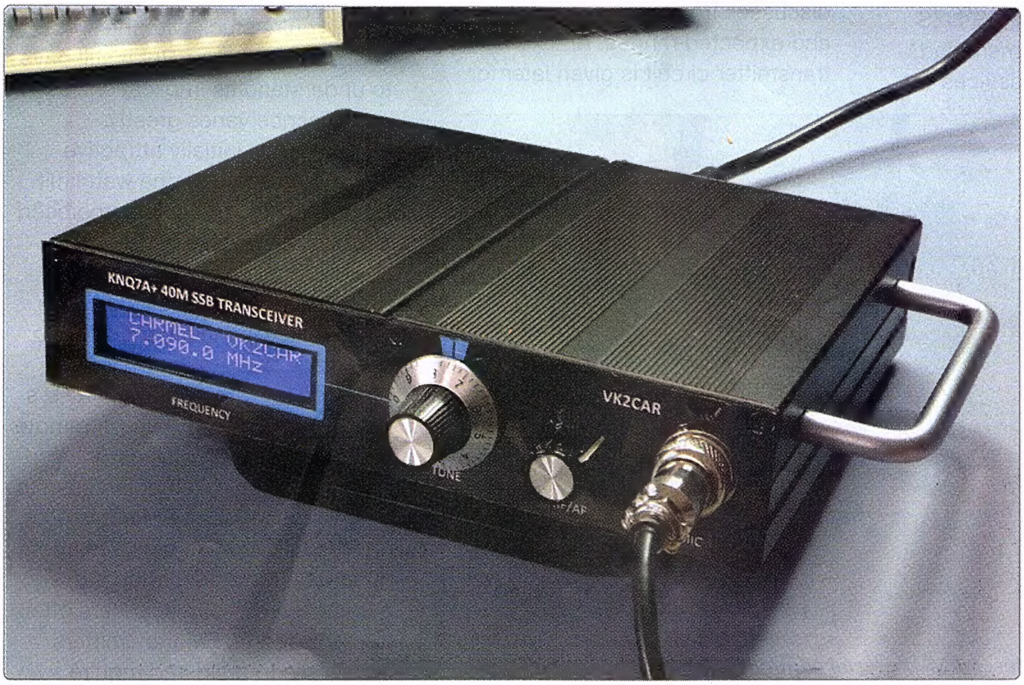

Photo 3: The final radio sits proud on a rarely-cleared workbench.

Little transmitters around the shack

Peter Parker VK3YE

Station uses for class licensed LIPDs

While most amateurs have access to a wide variety of bands, modes and equipment, the use of non-amateur frequencies is sometimes still necessary or desirable.

Examples include remote control of equipment, for example for outside antenna switches or tuners, audio links from remote receivers, test beacons including weather station telemetry or local links, such as between house and shack. Small transmitters are also useful for educational purposes, such as explaining radio theory, transferring images between computers or digital mode experiments.

It might surprise some that many frequencies are freely available for low power communications. Transmitters are subject to the Radiocommunications (Low Interference Potential Devices) Class Licence 2000 and do not need to be individually licensed. Instead manufacturers self-certify compliance using AS/NZS 4268:2003 Radio equipment and systems – Short range devices – limits and methods of measurement.

LIPDs attract no licence fees. Power limits can be generous. Neither are there identification requirements nor restrictions on unattended operation. All these conditions make then ideal for many amateur station applications.

There are few drawbacks in using LIPDs. Legally they do not receive the same interference protection as other equipment; users must accept any interference from higher powered licensed users or other LIPDs. Secondly LIPD users must cease transmitting or change frequency if they interfere with primary or secondary users. Consequently LIPDs are inappropriate for safety-critical applications but suffice for casual use if their frequency is selected carefully. Similarly those using an LIPD to control an amateur transmitter would want some form of encoding to prevent false triggering.

LIPD transmitters are commercially available. This article discusses frequencies, modes and expected ranges. An example transmitter circuit is given later for those interested in learning more about how a simple one works.

Photo 1: LIPD walkie talkies. 27 MHz crystal controlled, 41 MHz free-running and 55 MHz crystal controlled.

Frequencies

Schedule 1 of the LIPD Class Licence lists power limits, permissible frequencies and permissible uses. Many bands are available but only some have attractive power limits. The most useful of these, allowing at least 100 milliwatts EIRP for all transmitters, include:

13.553 - 13.567 MHz, 26.957 - 27.283 MHz (one watt), 29.7 - 29.72 MHz, 30 - 30.0625 MHz, 30.3125 - 31 MHz, 36.6 - 37 MHz, 39 - 39.7625 MHz, 40.25 - 40.66 MHz, 40.66 - 41 MHz (one watt), 70 - 70.24375 MHz, 77.29375 - 77.49375 MHz, 150.7875 - 152.49375 MHz, 173.29375 - 174 MHz, 10500 - 10550 MHz and 24000 - 24250 MHz.

Other LIPD bands exist for specific purposes or have lower power limits. An example of the latter is the 433 MHz band, for which prebuilt data communication modules are available.

If using a commercially made LIPD, you're stuck with the supplied frequency. But it still pays to understand its implications as performance varies greatly.

27 MHz is initially attractive due to its generous one watt limit. However there are many prohibited frequencies (basically the CB channels) and interference from powerful industrial, scientific and medical (ISM) equipment. 28 MHz from your own station may also overload LIPD receivers. 27 MHz's main advantage is its use in remote controlled cars or walkie talkies so you may be able to modify these for your purposes (See Reference 2).

The LIPD bands between about 30 and 50 MHz are better and quieter. Even cheap scanners often tune this range. FM transmitters are simple to build and require little frequency multiplication. Most bands permit 100 milliwatts, with one watt allowed in the 40.66 to 41 MHz segment. 30 - 50 MHz LIPDs can also be converted to six or ten metres if you have a yearning to build an amateur transmitter.

Higher VHF frequencies better suit handheld equipment with smaller antennas. These frequencies also allow easy gain antennas if building a longer range link. Note though that the power limits for LIPDs (unlike amateur licences) are based on effective radiated power, which factors in antenna gain. If you do use a good beam transmit power will need to be reduced down to perhaps 10 milliwatts. Nevertheless beams are still worth considering where low power consumption is desired, for instance, if using solar power from a remote site, or specialised VHF amplifier transistors are unavailable. Disadvantages with the higher VHF range include more complex transmitters, increased risk of spurii, need for specialised VHF transistors and reduced availability of crystals.

Monitor your proposed frequency before putting anything to air. Frequencies around 27 and 40.66 MHz are often busy. 151 - 152 MHz has many ethnic narrowcast stations while 174 MHz is near a TV channel. In contrast the low VHF range contains many spare frequencies where you won't be bothered and won't bother others, so may be a better choice.

Modes

Suitable modes for voice links include wide band FM, narrow band FM and AM. Wide FM is used in the simple 88 - 108 MHz FM wireless microphone kits with free running oscillators.

Narrow FM is easier to generate from more stable crystal controlled transmitters and can be picked up on any scanner that covers the right frequencies. Other benefits include its crisp audio quality and freedom from interference.

AM, still used for toy walkie talkies and remote controlled models, is also worth considering. It is more prone to interference than FM but its weak signal performance is slightly better. Its main advantage is that it can be received on simple single transistor super-regenerative receivers. AM also does not require frequency pulling and multiplication, so can be directly generated on the transmitted frequency. An LIPD AM transceiver may use just four or five transistors if all stages are used for transmit and receive functions.

Overall I recommend narrow FM and would consider AM only if building both a transmitter and receiver.

Power and range

Surprisingly little power will do most jobs. The 100 milliwatt legal limit will span several kilometres with a good receiver. Tens of milliwatts to an outdoor dipole will cover 500 to 1000 metres in suburbia, with range down to maybe 200 metres if using a small indoor whip or loop. One milliwatt will do a house, backyard and the neighbours, so may be all you need.

Low power is often an advantage; it lessens interference risks and allows transmitters to be made

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entirely with small signal transistors. If measured collector current times collector voltage is less than the legal limit, and antennas of unity gain or less are used, then your output is sure to be safely under the limit.

Sources of LIPDs

There are many commercially-made LIPDs. Toy walkie talkies, baby monitors, remote controlled cars, wireless doorbells and garage door openers are examples. Frequencies vary, with 27, 29, 41, 49, 55 MHz and UHF being favourites. Hamfests, garage sales and secondhand shops are good sources. Cheap old equipment is often better than cheap new gear. The author field tested a $7 pair of new walkie talkies. They barely worked, with just a 20 metre line-of-sight range. Inside was a 41 MHz free-running transmitter oscillator that drifted 50 kHz when brought to the mouth. In contrast a 1982 crystal controlled 27 MHz unit (a hamfest dollar special) was received clear and stable over 100 metres away. I suggest using only crystal controlled equipment for best reliability and stability.

The author has only tinkered with voice LIPDs but remote controlled toys have circuitry useful for station control applications. Reference Two provides some useful hints for those modifying commercial items.

Photo 2: LIPD constructed for test purposes.

An LIPD FM transmitter circuit

Monitoring a shack receiver in the house is a common LIPD application. Such a link would be particularly useful for the summer DXer whose backyard shack is a hot tin shed.

A cheap VHF scanner or similar can serve as the receiver. A frequency modulated crystal oscillator forms the NBFM transmitter. Figure One, designed for 36 MHz, is about the simplest possible, with a few milliwatts output.

Speaker level audio from the receiver is fed to two parallel diodes which vary in capacitance in sympathy with the applied audio voltage. The changing capacitance varies the frequency of a transistor crystal oscillator by one to two kHz. Varactor diodes could provide a greater shift but these are not commonly available and the specified power diodes will suffice.

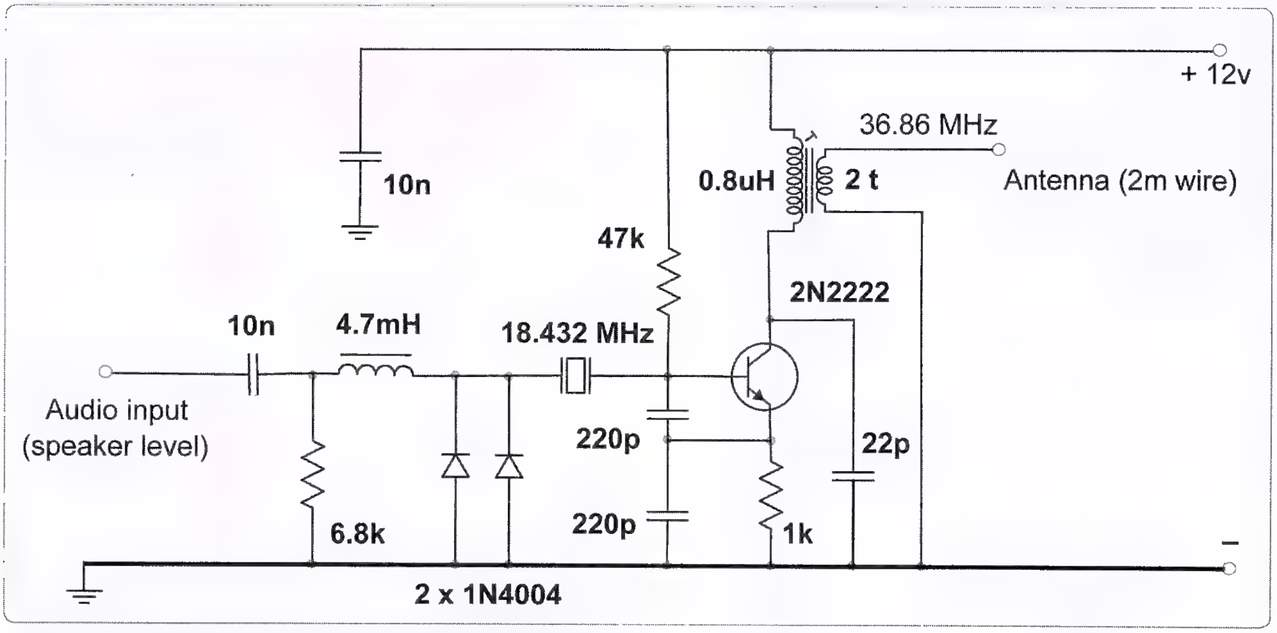

Figure 1: The circuit of the 36 MHz LIPD FM transmitter.

The oscillator uses an 18.432 MHz crystal, common in computer equipment or available cheaply. The transistor's collector is tuned to its second harmonic, which is safely within the 36.6 - 37 MHz LIPD segment. Doubling the frequency also doubles the deviation, making it sufficient to be heard on any narrow FM receiver that tunes the range.

Photo 2 shows an LIPD constructed for test purposes. Because there are so few parts, no printed circuit board was used. Instead parts were soldered onto the copper side of a small piece of unetched board.

All components are common except the salvaged slug-tuned inductor. This has eight turns of 0.5 mm diameter enamelled copper wire on a seven mm slug-tuned former. Its inductance is approximately 0.8 μH. You'll need an oscilloscope, calibrated wavemeter or receiver with a signal strength meter to ensure that the output is peaked correctly. If your inductor doesn't have a variable slug, you'll need to replace the 22 pF capacitor with a 30 pF trimmer to obtain resonance. You can tell you're tuned up right if the desired harmonic (36 MHz) is stronger than the unwanted 18 MHz fundamental, 55 MHz third multiple and all other higher multiples.

Some old or cheap scanners may have coarse frequency steps, for example, 25 kHz, and your transmitter may be slightly off. An RF choke (use a few microhenries) in series with the crystal will move the frequency down. Conversely lowering the 220 pF capacitors to (say) 100 pF should raise it a little. One thing to watch for when changing values is to ensure that they don't distort the transmitted audio.

What can you expect from such a simple transmitter? Around house coverage should be possible with a few centimetres of wire as an antenna. Those on large properties can get extra distance by adding a dipole formed from two pieces of wire two metres long. This should be good enough for a 300 to 500 metre range, even from indoors.

Though of equivalent complexity, you'll find this transmitter is more stable and has longer range than most FM bug kits. For this reason it's a useful educational project even if you don't have a use for it (yet).

Conclusion

The LIPD Class license opens a world of experimentation overlooked by most amateurs. Relaxed conditions and generous power limits make it ideal for local links. And even if you currently have no use for an LIPD, modifying and testing one is educational and enjoyable in its own right.

References

1. Radiocommunications (Low Interference Potential Devices) Class Licence 2000, available at *www.acma.gov.au*
2. *www.talkingelectronics.com*

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Tail wagging wireless

Steve Mahony VK5AIM

Dick and Mick are two amateur radio operators who delight in designing, building and using their own amateur radio equipment with the latest technology.

Their latest venture into technology is ARPS. ARPS stands for Amateur Radio Positioning System. It is a combination of GPS, the global positioning system from the US satellite system with amateur radio VHF/UHF transmitting and receiving ability. The positioning data comes from the hand held GPS receiver: the units can be purchased for about $300 for personal bush navigation, sending it to a receiver linked to a computer via an amateur radio transmitter. With a small unit interfacing the GPS with the transmitter and a similar unit interfacing the amateur radio receiver and a computer running a topographical local mapping program, the location of the portable transmitter is indicated with a symbol on the map display.

Dick and Mick first tried it out with their own GPS, an interface and a laptop computer in their own car. They were amazed to see the little red dot moving around the laptop screen as they drove around town. They then linked the GPS into the amateur transceiver in Dick's car. A computer at Mick's home with the mapping programme installed was linked to a receiver capable of receiving the GPS data from Dick's vehicle mounted system. Mick was amazed; he could tell were Dick was to within about three metres. Even tell him how to get to a given location.

Reading technical articles on ARPS and asking among the amateur fraternity, they were informed that small GPS receiver modules without the display of the hand held units were available that only gave out the GPS data.

A small GPS unit was purchased and with some simple electronic circuitry it was interfaced to a small amateur hand held transceiver. When it was all connected up and working satisfactorily Dick with the GPS unit in one pocket and the hand held transceiver in another, set off around their suburb. He had another amateur hand held transceiver, on another frequency to enable him to talk back to Mick at home. It worked well, not quite as good as the vehicle setup. The hand held transceiver had only five watts RF output, while the vehicle transceiver had 25 watt RF output. Mick could see and tell where Dick was most times. If Dick was close to big metal sheds, inside a building, or in an underground car park the signal was lost. It was agreed to be a great success.

They decided to try the system in a nearby park. Dick equipped with the personal portable ARPS wandered off into the park. Mick sat in the car with the receiver connected to a laptop computer. Again there was a voice radio link. The portable GPS transmitted GPS data every 30 seconds so that the symbol on the laptop jumped around on the map at 30 second intervals. Mick had a small Yagi antenna that he could point in Dick's indicated direction, thus avoiding drop outs on the signal.

Mick could track Dick even when he was out of sight, down in creeks, up on rises and even in undergrowth. Again it was a great success.

In chatting about the success of the system, Mick wanted a more difficult object to track! How about fitting the ARPS to 'Blue', Mick's Blue Heeler dog, and setting him free? I don't think Blue would let anyone steal the ARPS off his back. They fitted the ARPS to a light harness attached to Blue; he enjoyed all the attention. The unit looked and worked well. They set him loose in a local park where dogs were allowed to go free. It worked well, but the dog came back home after 30 minutes. They laughed when the tracking data indicated the dog had stopped many times! They guessed at what the dog was doing, as there were a lot of trees in the park! They tried it again out in the bush/scrub well away from the city.

It was noted that they lost the signal some times in the undergrowth, but the directional Yagi antenna minimised this. The trouble was that the antenna on Blue was so close to the ground. It was suggested that they get a taller dog!

At club meetings Mick talked to another amateur who was an officer in the police search and rescue section. He chatted about their 'tracker dog' experiment. Could it be used by the police to help find a 'lost person'? Allan the officer/amateur said he would tell his boss about the tracker dog. Would they, Mick asked the police, like a demonstration, even have Dick and Mick join in on an exercise?

Some months later Allan contacted Dick and Mick and gave them a phone number to ring to arrange a meeting for a test run. On the nominated day Dick and Mick met the search CO at the HQ with the dog transmitter and harness. The group, Dick and Mick along with several officers, dog handlers, and a tracker dog made their way to the local National Park. While the tracker dog was fitted with his tracker radio and tested, one of the handlers, with hand held radio, set off into the scrub. After about 30 minutes the lost police officer called in and said he had left a piece of his clothing at a given location and was returning back to the group. The dog was released and nose down, tail and radio antenna wagging was soon out of sight. The computer tracking showed the dog's location on the map display as the GPS location was transmitted every 30 seconds. After about 25 minutes the tracker dog found the clothing, as indicated by no change in the GPS reading. This was the same as given by the lost police officer via his radio link. He was informed of this and made his way back to the location to be made welcome by the dog. The dog and his handler were tracked back to the base on the system as an exercise. Again in parts of the denser scrub dropouts in the transmitted signal were observed, but they were not critical this time. With eats and drinks for all at the base the whole exercise was deemed a success.

Four months later Dick was surprised to receive a phone call from the police rescue and tracking officer asking if he still had his GPS dog tracker available and working. 'Yes' said Dick, 'It will probably want a new set of batteries.' 'OK, you fix that up' said the officer. 'A young child has been reported lost in scrub land south of the metropolitan area'. 'The search and rescue people along with the chopper and tracker dogs are going down there. Would you like to bring your dog tracker down to the police HQ and we can see how it works on the real thing'? 'OK' said Dick, I will be at HQ in about 15 minutes'. Thirty minutes later Dick and Mick were on their way to the site in a police vehicle. At the site the SES volunteers were already combing the bush. While Mick set up the laptop and the receiver with the directional antenna, Dick assisted the dog handler to fix the tracker to the dog. All was tested OK.

After a good smell of some of the lost child's clothing, supplied by the worried parents, the dog handler led the dog some distance in the direction the child was believed to have gone. The dog wandered around for a few minutes before picking up the scent. The handler released the dog. Its location was immediately picked up on the laptop's screen. On a larger map officers plotted each location to get a bigger picture of the child's wandering.

They were all informed that the rescue chopper was on its way. It would be given the dog's GPS location if necessary. The track of the dog and child went away from the release point for about 5.5 km, and then veered to the right. It continued in an arc right around the group and back behind them. The SES were all called back and told to be ready to be deployed in a different direction. It was about an hour since the tracker dog was released.

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The chopper called in saying it was minutes from the base, approaching in the direction that the tracker dog had gone. They were given the last tracker dog GPS bearings and asked to keep a sharp look out. Some three minutes later the tracker dog's GPS readings indicated that the dog had stopped moving. Had the dog found the child? The rescue chopper was immediately given the GPS readings via the radio. The pilot informed them that they were heading in that direction.

The group could see the rescue chopper as a shape low in the sky back behind them. The tracker dog's readings had not changed. All were excited. Next minute the chopper pilot said. 'The dog has found the child, we can see them both'. A cheer went up from the group at the base site, with smiles all around.

'They are both in a more open area, the child has seen the chopper and is waving, and the dog is looking up. We are about 300 metres away and will lower a medical officer down. He will walk over to the child and check him out. We will keep you informed'.

The chopper called again.

'The medical officer reports that the child is OK, apart from a few minor scratches to his bare legs. He was more excited about the chopper and was disappointed he would not get a ride in it. We will go back to a nearby dirt road and give you the GPS location. Meanwhile the officer on the ground will walk the child and the dog out to this point'.

The child's parents were hugging each other. Tears were streaming down the mother's cheeks. The OIC asked the parents to be prepared to board the police 4WD and go to the rendezvous point when called.

Minutes later the chopper called giving directions to the meeting place along with the GPS readings. The parents boarded the 4WD and headed off leaving the rest of the search group to relax and enjoy a cuppa and biscuits.

It did not take the group long to reach the meeting place. The chopper had landed in a cleared area some 200 metres away and was waiting for the medical officer. They all got out of the police vehicle and looked in the direction they expected the rescued and rescuer to come from. They did not have to wait long, the child was first to see the parents. He left the officer, shouting, 'Mum, Dad' and ran the last 50 metres through the scrub to them. The officer followed with the tracker dog. After hugs and kisses with his parents they all got back into the 4WD. The medical officer then walked over to the waiting chopper. The tracking dog with his GPS turned off, as per radio instructions, was led back to the dog handler's vehicle, which had recently joined the group. They all waved to the chopper as it rose and 'wrap wrapped' off. They all returned to the base and joined in the refreshments.

The child's parents thanked the SES searchers, the tracker dog handlers, and when shown the radio transmitter on the dog with the tracking system and the part Dick and Mick had played with the 'tail wagging tracker', they thanked them both. The child was allowed to pat the dog and thank it. Dick and Mick returned to the S&R HQ and then went home, pleased with their ARPS system. They were asked to come to the S&R HQ at a date and time to be arranged to add to the report on the tail wagging tracker radio and discuss its design for a commercial unit with the S&R technical people. This they did.

As to whether a commercial unit was designed and built is not known at the time of writing. Dick and Mick called their units TAILS, Tracking Amateur Indicating & Locating System...

(Editor's note: This story is another of the many works of fiction written by the author, interlaced with some factual possibilities.)

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AR88 receiver capacitor rebuild

David Williams VK3RU
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Photo 1: The capacitor.

Do you own a classic wartime receiver? Does it contain 'Bath Tub' or 'Tub' capacitors?

I was fortunate enough to acquire an AR88 from the estate of the former VK3RU and it now takes central position in the current VK3RU shack. Roy was a great friend and mentor from an early age and I enjoyed listening to this rig in his shack.

For those not familiar with the AR88, it is a wartime general coverage receiver built under the RCA banner in two varieties, most commonly the AR88D. The 'D' covered 535 kHz - 32 MHz in six bands. The LF version AR88LF covered 73 - 550 kHz and 1.480 - 30.5 MHz also in six bands. Mine is the more common AR88D.

In recent times my receiver had failed to fire up and as a result had not been switched on for several months. The recent Melbourne Cup Day public holiday in VK3 plus an extra day off for me presented a good break and some time for AR activity. A great opportunity to exercise some muscle, extract the receiver from its home, turn it over and make a start. Please note this is not a simple task; the rig weighs more than 45 kg and was buried under gear on my bench.

Under normal conditions, firing up this rig is a two stage process. First, transmit or heaters on, then step two, receive or HT on. It is usual to leave a few moments for the heaters to warm up before step two but when selected, the loud HT splat is timely warning of the high voltage involved in this radio. For those unfamiliar with valves, high tension (HT) or high voltage (HV) should be treated with respect. Typically the AR88 HT is around 235 VDC. In my case, when switching on step one, the radio responded normally (dial lights on etc.); however when selecting stage two, no splat and no audio. Not even a crackle in the speaker or clunk when the HT was applied; potentially serious stuff.

I managed to wrestle the rig onto its back to find yet another warning and an indication of the possible fault, fresh oil soaking into the timber bench top underneath.

HT is one thing, but the prospect of PCB is another and both are often found inside many older valve rigs. The AR88 is no exception. Repairing an old valve rig is a task I was trained to do in my younger days but we were not trained to deal with PCB and this required some modern day research. Those interested in AR88s will find a number of websites associated with this rig, all providing plenty of information including manuals and circuits, most importantly advice on dealing with PCB and rebuilding capacitors. PCB or polychlorinated biphenyl was used as a heat conductor and electrical insulator most often inside old and often large high voltage outdoor electricity distribution transformers. PCB has now been identified as a skin irritant and potentially carcinogenic material. Like HT, it is stuff to be treated with respect. Needless to say I was off to purchase some Nitrile gloves before sitting down to remove the capacitors, strip down, replace their content, reinstall and hopefully return the rig to service. Nitrile gloves are recommended and I found them available at a local hardware store at a reasonable price.

Removing the tub capacitors was relatively straight forward. Switch off, pull the power plug out, short the HT for safety and get to work. If you are a bit of a purist like me, the thought of simply replacing the three capacitors included inside each tub with external modern components was not an option.

I chose to rebuild both tubs to retain their original appearance even though they are buried under the chassis. Tub one was 3 x 0.1 mfd/400 V and tub two, 3 x 0.01 mfd/400 V. As I was to replace the old paper capacitors with more recent polyester components, there was no need for any additional form of insulation or heat conduction material.

The process of tub rebuilding called for the case or tub to be drained of potentially dangerous PCB oil, peeling then unsoldering the back of the metal before replacing the original contents. Close inspection with capacitors removed and cleaned up revealed the likely cause of leaking oil to be perished capacitor terminal seals. The old red coloured rubber like material actually disintegrated when brushed with methylated spirits creating a reconstruction problem. Loose and uninsulated capacitor terminals. My problem was solved by aligning the original terminals close to their original position and applying five minute epoxy to effectively fix and insulate above case ground.

My web search revealed a simple and basic check for PCB material. 'Place a small amount on a piece of copper wire and heat with a gas flame. If a green flame is produced, then the liquid is highly likely to contain chlorine (or other halogen) and could be PCB. If the flame has a yellow colour, then the liquid is more than likely straight hydrocarbon oil'. After drilling the first capacitor I ran the test and produced a yellow flame. At this time I must admit to relaxing a little, but was still not prepared to remove my special gloves and goggles. I was taught to be cautious.

Finally with both capacitors safely returned to their original locations, I steadied the rig in preparation for its big test. Sadly this test failed with still no audio. Maybe those capacitors were not the cause after all? Maybe I should have checked the HT earlier but those capacitors needed to be addressed anyway? I left the rig running with HT on whilst I searched for my meter and cleared the bench. It was not long before a burning smell appeared along with a wisp of smoke. These old rigs are so forgiving that even after emitting smoke they will usually live on and the source was quickly identified. Pretty well all original cabling inside the AR88 chassis is cotton covered and in many respects beginning to fray in my old rig. The source of smoke was burning cotton covering on an original HT cable run through a small opening in an RF shield. Possibly during the process of my capacitor rebuild this cable had been disturbed resulting in an effective HT short to ground. The fix was a simple repair and further testing demonstrated a radio functioning beautifully with far

Photo 2: The second capacitor.

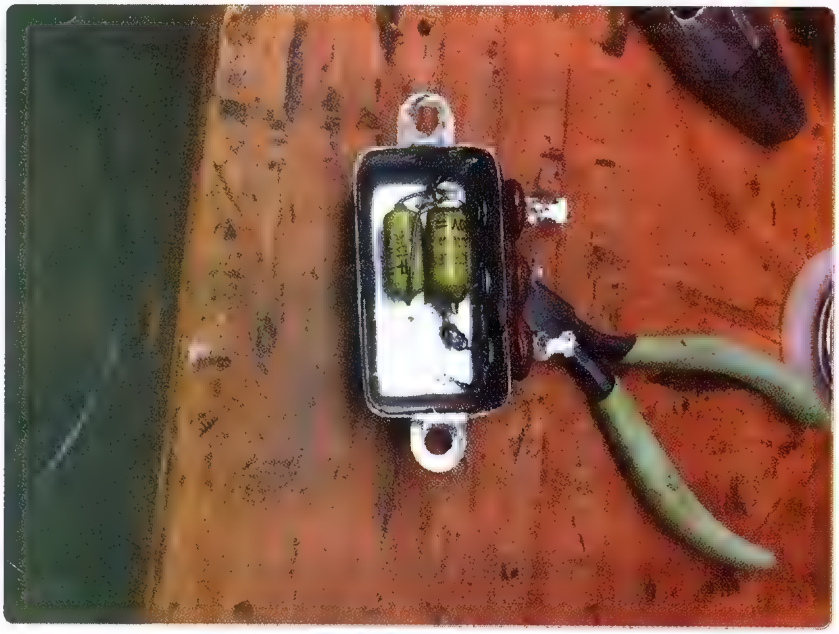
Photo 3: Capacitors C5, C6 rebuild.

better audio than I can remember for some time. Those interested in audio will note that I was fortunate enough to have a small selection of Mustard capacitors available in my collection which are well known for their sound quality and physically suitable to complete my rebuild.

I found the entire process relatively straightforward but taking advice from the web it was completed using chemical resistant gloves, goggles and considerable care whilst stripping and cleaning the tubs using a combination of kerosene and methylated spirits to clean up. I collected the capacitor oil, old capacitors and used cleaning agent in a glass jar clearly marked and stored for the next local council dangerous goods collection. *[Ed. Some municipalities do not have dangerous goods collection days anymore, but will still provide information as to where these goods can be taken for safe disposal. Polychlorinated biphenyls are considered dangerous and must not be disposed of in rubbish collections.]*

So, was it a HT short the cause of my failure or leaky capacitors? Who knows or cares, for sure this as a very satisfying project. After a little research and a few hours effort the old rig takes pride of place on the bench once more.

Photo 4: The AR88 back in service.

A word of warning

Anyone completing a similar capacitor rebuild would be well advised to complete similar research on PCB handling precautions and then proceed with extreme caution. An internet search based upon AR88 lists a number of websites and those listed below provide an excellent place to begin your own research.

Web References

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http://www.meeching.com/circuits/files/AR88D1.pdf

http://www.csenergy.com.au/userfiles/Corporate_PCB_filled_capacitors.pdf

http://www.environment.gov.au/settlements/publications/chemicals/scheduled-waste/pcbidentification.html

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Silent Key

Bob (Fuzzy) Cruise VK2FZZY

It is with deep regret and great sadness that I advise the passing of Bob Cruise on Wednesday 31st July 2013, aged 50, after a long and painful illness.

His passing comes just one year after Bob gained his much valued and cherished Foundation licence, achieved whilst he struggled with ill health. Thus his chosen call sign Foxtrot Zulu Zulu Yankee, Bob tongue in cheek referred to himself as Fuzzy, a term of endearment that his close friends also called him. During the early part of this year Bob attended classes at ARNSW Dural to upgrade to a Standard licence but due to illness was unable to continue.

Bob's interest in radio stems from his CB days and in eventually finding that amateur radio was more interesting and technically challenging, and in also enjoying the company of fellow amateurs he met along the way. Bob is a member of ARNSW and will be missed by those who knew him.

He is fondly remembered and sadly missed by his sisters Mary and Kathy and his many nieces and nephews. In addition Bob was an active member of the Salvation Army Ryde Corps where he supported the local community in the North Ryde housing estate; despite his illness he volunteered his time to assist with many community activities, and his passing will be missed by all at the Salvation Army Ryde Chapter.

Vale Bob Cruise VK2 Foxtrot Zulu Zulu Yankee.

Submitted by Stuart Walker VK2FVSW

A dipole story

Noel Ferguson VK3FI

You now have your Operator's Certificate up on the wall and a brand new, or maybe a second hand, transceiver hooked up to the power supply and ready to operate. But what to do about an antenna?

You have read the Foundation Training Manual and looked at examples such as the end fed and vertical antennas. Both look easy to construct and erect, but the disadvantage seems to be the need for an antenna tuning unit (ATU) and the earthing requirements for those types of antennas.

So maybe it's time to go back to basics, and as a starting point, let's think about when you might have time to operate and where you would like to communicate. Let's say for the exercise that you are a senior school student with most evenings taken up with homework and maybe with a bit of luck, even some relaxation. In fact you say you would be happy if you are able to go 'on air' day time weekends and communicate to other amateur radio operators in your own and adjacent states.

The answer is simple. The forty metre band with a good old half wave dipole set up at a modest height. The dipole can be trimmed to provide a perfect match to 50 Ω coaxial cable at about six metres above ground. And the resulting high angle of radiation will provide efficient communication over the relatively short distances involved.

So let's look at the dipole characteristics. Ask most amateur operators what is the feed impedance of a half wave dipole and you will get the answer as being in the vicinity of 70 Ω. Yes, correct for a dipole in free space or in fact a half wave above ground. But let's look at a dipole's feed impedance at lower heights from ground. Figure 1 shows the way in which 'the radiation resistance of a half wave dipole antenna varies with height, over a perfectly conducting ground' (Reference 1).

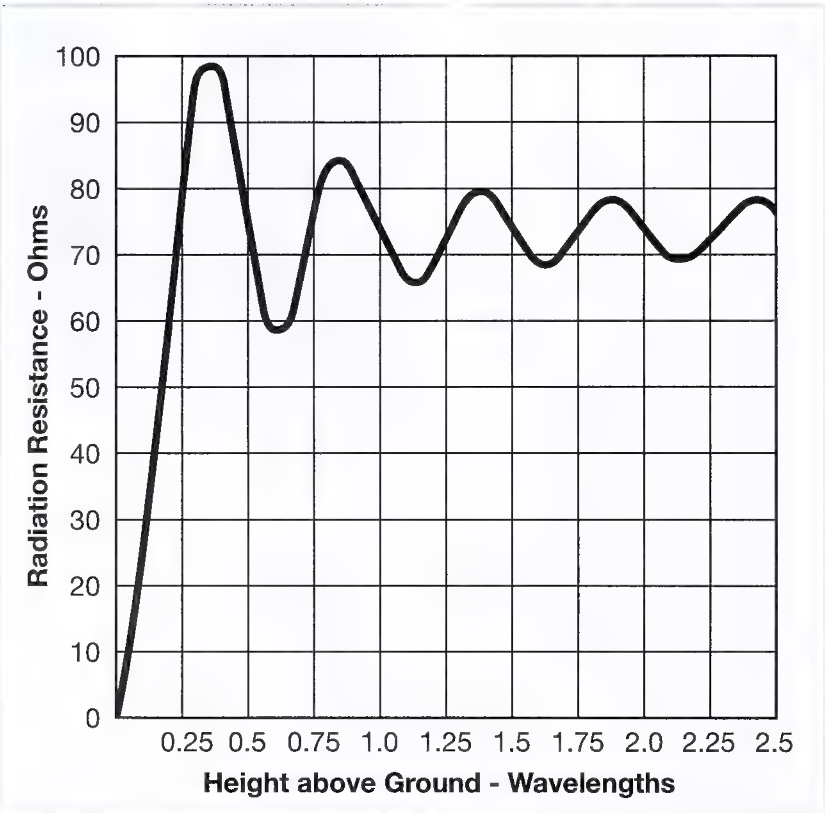

Figure 1: Variation in radiation resistance of a horizontal half-wave antenna with height above perfectly conducting ground. ARRL Antenna Handbook 1984, 14th edition.

It can be seen that at a typical amateur radio height, a dipole has a feed impedance more like 50 Ω than the theoretical 70 Ω. And, as it turns out, height is convenient to obtain albeit by using a house or maybe a couple of trees as anchor points, or alternatively supports made up from stock steel tubing. While few of us have a perfect ground for our antenna, the same broad theory applies in a typical backyard as will be shown by my antenna tests.

But before we look at my antenna, what is required to construct the forty metre dipole? While hard drawn copper wire is the preferred material for the dipole, stainless steel or electrical cable has often been used. My portable dipoles are made up from standard figure of eight (lamp cord) split in two. Applying the standard formula to calculate the length of a half wave dipole gives an overall length of 20.070 metres. Or 10.035 metres each side of the centre feed point at a frequency of 7.100 MHz. The formula allows for the end effect of insulators and the like (Reference 2).

I recently quoted the basic dipole formula to a new F call holder and followed up with 'but you will have to trim the length for best SWR.' The surprised comment, 'I thought if you calculated the length, that would be it.'

No, the calculated length is the starting point only. Height of the antenna and any adjacent buildings together with ground conductivity at your location will have an effect on the resonance and resulting SWR. I quote from the Foundation License Training slides, Gateway to Amateur Radio, Section 5, 'the antenna should be resonant at the frequency to be transmitted – received' (Reference 3).

It's suggested you add some twenty five centimetres to the calculated length of each leg, and then do several checks at points across the band. Hopefully you will see the lowest SWR at the bottom end of the band. Proceed to trim a couple of centimetres off each leg, and recheck until the best match, that is lowest SWR, is obtained within the band, for example at 7.100 MHz. Or if you have a local amateur with an antenna analyser, that will make the job of tuning much easier. Having said that, the manual method is an interesting exercise and should be seriously considered.

Because of the need to drop the antenna for tuning, a pulley at each support point is recommended. Yellow nylon rope has been used successfully to tie back each leg. But even better is a black nylon cord available from time to time from hardware shops at a reasonable cost. Insulators and other dipole parts are available from the suppliers who regularly advertise in *AR* magazine (Reference 4). But if you are stuck for insulators simply cut a 10 cm length of PVC conduit, drill a hole each end for the dipole and tie off cable, and you have a practical insulator.

But we are getting ahead of ourselves. A feeder in the form of coaxial cable to connect the antenna to the transceiver is required. RG58C is fine at HF as the losses are quite low and it is relatively light weight to suspend from the centre of the dipole. It's preferred to use an electrical half wave of feeder, or multiple of a half wave, for the initial tests (Reference 5).

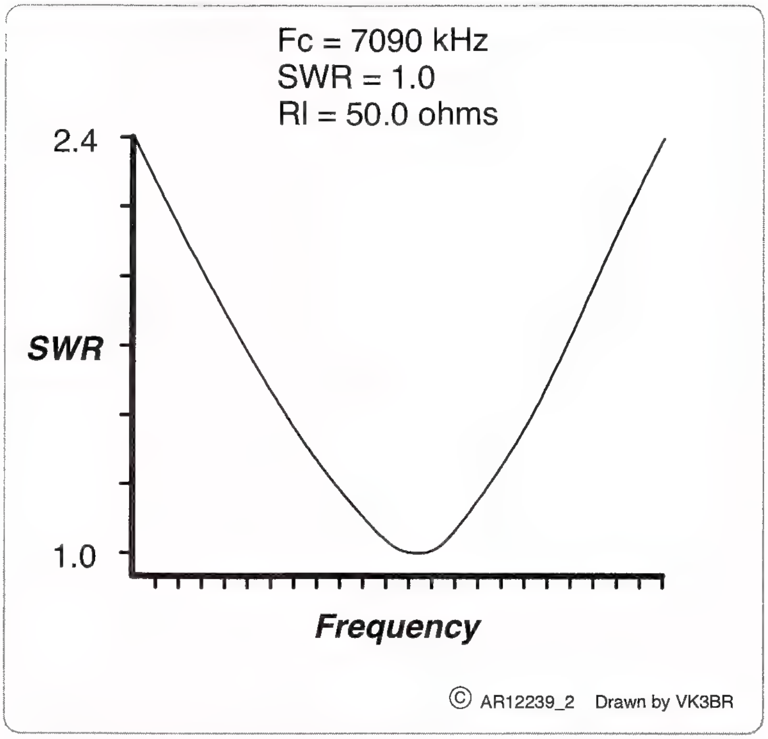

Figure 2: The VK3FI 40 metre dipole SWR Curve. (AEA HF Analyst).

Because the dipole is a balanced antenna and the coaxial cable unbalanced a one to one balun transformer is recommended at the feed point. Again I quote from the Foundation License Training slides, Gateway to Amateur Radio, Section 5, 'The balun is a type of transformer that can connect a balanced antenna to an unbalanced transmission line'. Balun transformers can be 'home brewed' or purchased from a number of *AR* magazine advertisers. For balun construction details – refer the ARRL Antenna Handbook.

Connections must be well sealed against the weather. Self-amalgamating tape is available from Altronics or Jaycar, but you can also use black insulation tape. Stretch the tape and wind it tightly around the coaxial cable and continue over the connector. Then complete with a couple of cable ties over the tape. While some eyebrows may be raised at that suggestion, I've checked after several years and found connectors sealed with insulation tape to be still like new. But you must put several layers on, and the insulation tape must be stretched tight to be effective.

If you are unable to set up two tie off points or masts, then the dipole may be installed in an inverted V configuration. The advantage is that only one centre support is required. But the V will pick up more noise than the horizontal dipole due to the vertical component of that antenna. But a good match may be obtained by carefully trimming the leg lengths and adjustment of the V angle. (Details of V angle verses antenna height etc. are available by Googling 'Inverted V antenna'). It's generally recommended that the antenna support be offset by about one metre if the supporting mast is metal.

But having said that, years ago I had success using the guy wires on a mast for an inverted V antenna. Additional antennas for other bands may be connected in parallel with the inverted V if the legs are fanned out. There will be some interaction, meaning several checks, will be required on each antenna to adjust for lowest SWR. Again, an interesting antenna exercise.

But back to the dipole. After trimming your antenna for best SWR, re-do checks but this time at the lower end of the band, say at 7.010 MHz and also higher up in the band to get some idea of bandwidth. The SWR curve of my dipole is shown in Figure 2. While the curve does not clearly show, the SWR in my case is 1.3 at 7.010 MHz and 1.3 at 7.220 MHz. Bandwidth will vary with the diameter of the dipole wire and the actual configuration.

And a performance comparison. I've found very little difference in received signal levels and transmission reports on both the half wave dipole and the inverted V antenna. Tests were conducted with the dipole at a height of six metres and with the inverted V apex at fourteen metres. Both antennas were made from 1.6 mm diameter hard drawn copper wire with a BU50 Diamond balun at the feed point.

While the above comments are somewhat simplified, and the dipole will not be your last or only antenna, the point is it's simple to construct and erect and with tuning will result in a low cost and effective antenna to get you 'on air'.

References

1. ARRL Antenna Handbook. An example from the 14th edition, 1984.
2. Length ½ wave dipole, in metres = 142.5 divided by frequency in MHz.
3. WIA web site: *http://www.wia.org.au* Assessment Resources, Foundation Licence Training, Gateway to Amateur Radio. Fred Swainston VK3DAC.
4. TET-Emtron. TTS Systems.
5. Electrical half wave of RG58C coaxial cable = 13.934 metres.

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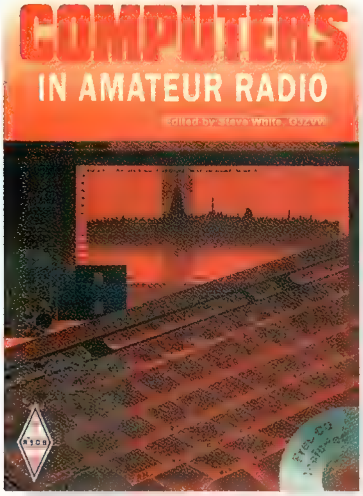
Edited by Steve White, G3ZVW



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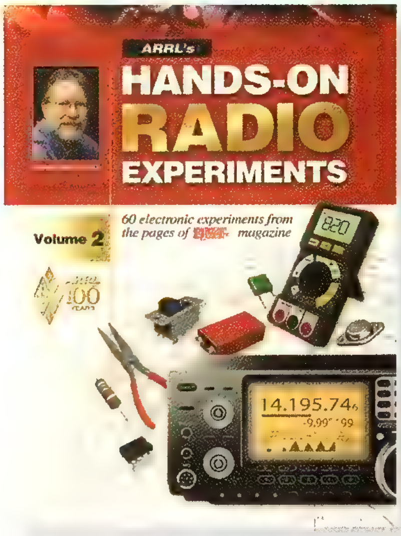
ARRL's Hands-On Radio Experiments – Vol. 2

H. Ward Silver, N0AX



QST's monthly "Hands-On Radio" column, written by Ward Silver, N0AX, is one of the most-read sections of the magazine. Wireless technology continues to develop rapidly and radio experimenters are eager to discover what makes their radios work. As long as we keep putting our hands on radios, there will be techniques to learn and circuits and components to try.

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WICEN NSW assists in large scale search in the Blue Mountains west of Sydney

Compton Allen VK2HRX and Steven Heimann VK2BOS

The Blue Mountains west of Sydney is renowned for its rugged beauty and is a major tourist drawcard in NSW and marketed around the world. Much of the area is a world class national park. As well as its immense natural beauty it can present significant risks for those who venture into it, especially if unprepared.

On 16 July, 2013 Gary Tweddle a 23 year old male and Sydney employee of Oracle, an IT technology company, went missing late at night from the Fairmont Resort near Leura in the Blue Mountains after a company event. NSW Police Rescue mounted a search and this increased in size and scale after the first few days.

In NSW WICEN is an affiliated squad of the NSW Volunteer Rescue Association (VRA), *www.rescue.org.au*

Photo 1: One of the BWRS search teams supported by WICEN and their commander at the end of a day's searching. Photo: Steve Diekman VK2MCA.

Photo 2: The set up inside the WICEN comms trailer with VHF, UHF and HF. Photo: Compton Allen VK2HRX.

The VRA is an accredited rescue service in NSW, funded in part by the NSW Government through the State Rescue Board and the VRA provides a wide range of land, air and marine rescue services, often on a primary response basis, as well as state wide specialist squads such as WICEN *http://www.nsw.wicen.org.au/* the Bushwalkers Wilderness Rescue Squad (BWRS) *http://www.bwrs.org.au/* and Cave Rescue *http://www.caverescue.org.au/*

The areas that the VRA teams were operating in for this search needed dedicated radio coverage. Initially this was provided by the BWRS using UHF commercial radios with a single operator on a high point. WICEN received a request to assist with the communications for the BWRS and vertical teams after completion of searching on the Friday evening.

Photo 4: Comms trailer with Clark mast three quarter raised to elevate the VHF dipole array above ground cover. Photo: Compton Allen VK2HRX.

When searching commenced on Saturday morning WICEN was on site and had established three radio relay sites. WICEN utilised an all member email list to notify members of the activation and to request members who were available to contact WICEN Operations.

BWRS and Cave Rescue along with vertically qualified police rescue personnel undertook the vertical search activities and were tasked to the extreme access areas involving remote access on and below cliff lines requiring vertical rope techniques. This included searching canyons and the immense cliffs, some 200 metres high. Searching these cliffs was undertaken by having land teams search along the tops and bases and then vertical teams abseiling down and prusiking up the cliff faces. This is a technically complex undertaking and the abilities of the BWRS, Cave Rescue and police vertical teams cannot be underestimated. Importantly they had no incidents themselves with multiple five man vertical teams operating, despite day after day tasking in the challenging search areas assigned to them. They were assigned some of the most difficult search areas which also equated to the most difficult to provide RF cover. They generally carry UHF and HF commercial transceivers. The HF rigs enable them to communicate from nearly anywhere using either ground wave or NVIS paths. The problem with the HF rigs is that they are heavy and take up to 15 minutes to set up and pack up. With hourly SITREPs required this can amount to 25% of their search time. Also it is not possible to contact the search teams outside scheduled times. The UHF portables are convenient but have limited range and don't cope well in mountainous terrain. The Blue Mountains offer particularly interesting RF challenges.

WICEN's task was to attempt to maintain top to bottom coverage for the particularly difficult assignments given to VRA teams. WICEN's coverage, message passing, logging, and ease of communications ensured the searchers and search managers could focus as much of their time as possible on the task at hand. WICEN implemented a VHF network and used a number of radio points to cover the nooks and crannies of the cliff faces so that we had continuous coverage of the vertical teams. The teams were required to call in with a SITREP every hour. Their calls in times were staggered so that all the teams could call in sequentially. WICEN provided a logging service for all radio traffic on the VHF network as well as collating hourly SITREP reports for the BWRS and police commanders and search coordinators at the police command post. It was interesting to note at times just how close a relay point could be placed to a

Photo 3: Comms trailer with VK2HRX tow vehicle. Photo: Compton Allen VK2HRX.

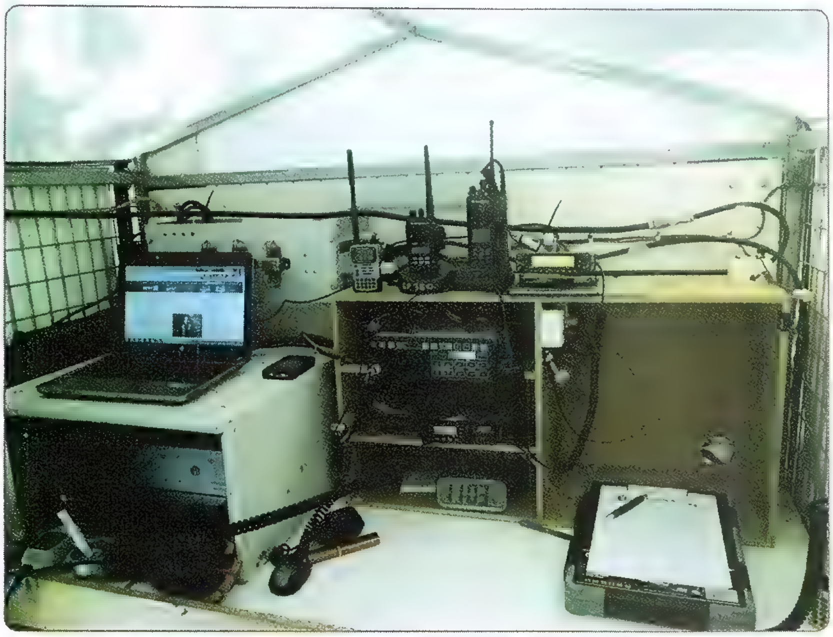

Photo 5: Inside set up on the comms trailer operating position. Photo: Compton Allen VK2HRX.

search team and still not be able to maintain comms between that relay and the team. Deploying a relay further away but looking up into the gullies or across to the cliff faces often worked best but wasn't always possible. It was essential that the relay points remained flexible as search teams moved around or were redeployed. One of the most useful tools used by the WICEN commander was the local topographic map. There seemed to be a few interesting path changes early in the day but by 10 am things seemed to stabilise until searching finished around 4 pm.

For police, SES and RFS communications was based on the fixed infrastructure of various government radio networks and mobile phones. Agencies using this reported that these deteriorated or failed completely when search groups started to descend off the high points of the ridge lines.

Although much of the radio networks in place can be scanned and listened to a mechanism was in place where key messages could be communicated to and from the Police Command Post in a secure way if needed.

WICEN had a total of 11 operators that were deployed from all license classes and a further four who had made themselves available. We contributed over 350 operational hours to the search efforts and provided our radio networks and sufficient operators for five days. At the end of five days we still had capacity to continue for several further days.

A typical day was to depart Sydney around 6.00 am and arrive on site for the morning briefing at 8.00 am. WICEN radio points were generally closed down between 4.00 pm and 5.00 pm with another two hour journey home, so a 13 hour day. Temperatures ranged from below 0C overnight to 9C during the day. The days were sunny with moderate to high winds at the often exposed radio points. We were able to have several locations as two man crews and for the locations where we had a one person site we were able to supply a relief operator as needed during the day to ensure that operators had sufficient breaks as needed. We operated a total of eight radio points throughout the five days. Some were for the full five days, others for maybe an hour to provide coverage to the mobile search teams. One short term site included a single operator with a hand held next to the resort's sewerage treatment works. Other sites had stunning panoramic views of the cliffs that typify the Blue Mountains. All of the sites were in public locations

Photo 6: A vertical combining BWRS/Cave Rescue and NSW police prepares for a day's searching. Photo: Jan Van Ekris VK2FEB.

so we had enquires and questions from the general public, print and TV news media plus a possible sighting of the missing person and evidence handed to us. These were all promptly reported back to the police command post for follow up.

WICEN operated a primary VHF commercial network around 160 MHz plus variously used 5 MHz, 78 MHz, 470MHz, two metre amateur and 70 cm amateur. Thanks go to BMARC for their Lawson two metre repeater which was used by operators as they travelled to and from the site. We also had air band capability available in case we needed to communicate with any of the Polair helicopters also searching the area. Searchers and search managers were generally not amateurs and commercial frequencies were used for comms direct with these people. Amateur frequencies were used for WICEN administration, management, and relays, which kept the commercial channel available as much as possible for search traffic.

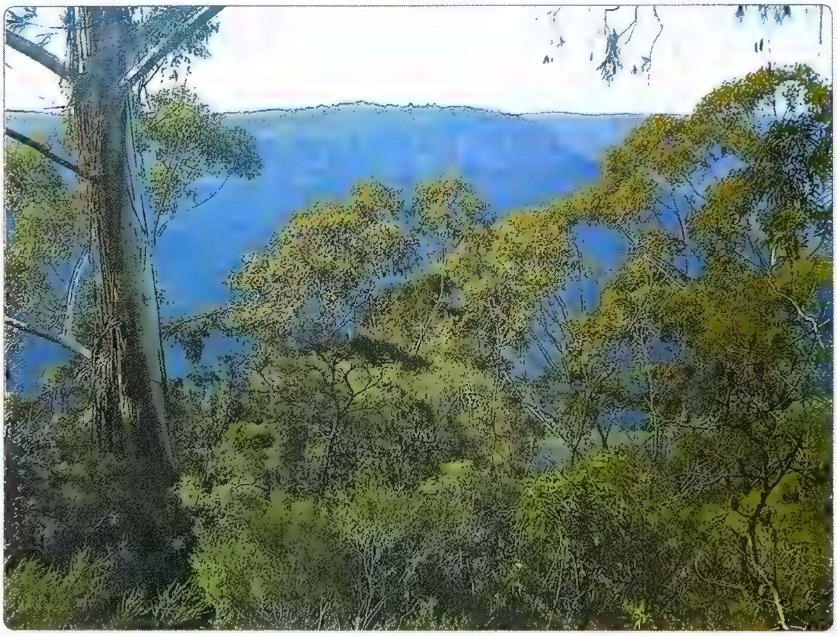

Photo 7: The Cliffs surrounding Sublime Point. Photo: Jan Van Ekris VK2FEB.

The search involved over 1000 man days and has been reported as the largest search ever undertaken by NSW Police Rescue. Police search coordinators made a point of recognising and thanking WICEN in press releases and in person at the command post. On some days there were 200 searchers active in the search area, on others there were 40. These were primarily volunteers drawn from the SES, Rural Fire Service and a number of VRA specialist squads. The other government agencies involved included NSW Police (General Duties officers, Bomb Squad, Divers and Police Air Wing), plus NSW Ambulance SCAT Paramedics.

The following WICEN members participated in the search. Steven Heimann VK2BOS and WICEN commander, Compton Allen VK2HRX, Martin Dalmazzo VK2FMUD, Jan Van Ekris VK2FEB, Mal Alexander VK2YVA, Erin Alexander VK2FEJA, Alan

Photo 8: The work continues in the evening preparing for the following day's activity. Photo: Compton Allen VK2HRX.

Photo 9: Portable radio point near Wentworth Falls. Photo: Compton Allen VK2HRX.

Whitmore VK2DAN, Nic McLean VK2KXN, Julian Sortland VK2YJS, Steve Diekman VK2MCA, Peter O'Connell VK2EMU and John Harper VK2HRK. Several others were also on standby. Thank you to your families, employers and respective agency for allowing you to assist.

For many years WICEN has provided communications at several annual events run by the BWRS including the Barrington Tops SAREX and Nav Shield. The experience of working with BWRS and setting up and operating radio points in the field proved to be extremely helpful for what was required during this search.

The Fairmont Resort strongly supported the search efforts and provided lunches for all search and support personnel, unlimited use of their car park for establishing a large command post, plus a number of conference rooms for daily briefings, press conferences and catering.

There are many news items on this search in the media as well as on social media. Search for 'Gary Tweddle' if you would like to find these.

On 26 July, 2013 the search was scaled back to a recovery exercise ready for when Gary Tweddle is finally found so he can be reunited with his family, friends and colleagues.

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VK1 celebrates six months of SOTA

Andrew Moseley VK1NAM

Photo 1: The antenna support on One Tree Hill, with views south towards Canberra. Photo by Ian Sinclair VK1DI.

Amateur radio was showcased to the public on Sunday 11 August 2013 on hilltops around Canberra. Nine VK1 SOTA qualifying summits were activated for the six month celebration of VK1 SOTA following its start on 1 February this year.

With a promise of good weather from the BOM for Sunday activators spent the week charging batteries, testing coax cables, going through dry run setups, fine-tuning antennas for multi-band operations and searching for that long-lost QRP ATU somewhere in the junk box. The rehearsals and equipment checks must have been effective. I didn't hear of any one leaving behind a power cable or forgetting to pack the 817 or leaving it on the kitchen bench.

Struggling to find sufficient VK1 activators to cover the local summits, we enlisted the help of keen SOTA activators from the NSW central coast, Ed VK2JI, Rod VK2LAX and Jim VK2LC. Ed volunteered to tackle Mt Taylor and meet the local wildlife, a mob of kangaroos. Unknown to Ed was that the walking tracks up Mt Taylor on a Sunday morning are very popular for people improving their fitness or the waist line of their favourite pet. Once on the summit the fitness fanatics pay homage to the Mt Taylor Trig.

Two of the 43 VK1 qualifying summits, One Tree Hill and Castle Hill are on private property. Andrew VK1DA and Andrew VK1NAM having previously contacted the respective property owners some weeks earlier, contacted the property owners on Saturday to finalise their plans and seek final agreement to access their land. Permission granted!

Given the likelihood of nine summit activations commencing at 0915 local, I had some concerns of major pile ups on two and 40 metres. With that in mind some of the activators posted an earlier start time of 0900.

Activators were:

- Matt VK1MA, Mt Coree VK1/AC-023
- Glen VK1FB, Mt Tennent VK1/AC-025

- Andrew VK1NAM, Castle Hill VK1/AC-032
- Andrew VK1DA and Ian VK1DI, One Tree Hill VK1/AC-035
- Ed VK2JI and party, Mt Taylor VK1/AC-037
- Al VK1RX, Tuggeranong Hill VK1/AC-038
- Mark VK1MDC, Peter VK1IRC and guest Andrew VK2FAJG, Mt Ainslie VK1/AC-040
- James VK1DR, Isaacs Ridge VK1/AC-041, 2 m FM only
- Andrew VK1MBE, Mt Stromlo VK1/AC-043, 2 m FM only.

The QRP action started early on Castle Hill with a big pile up of 31 chasers before UTC midnight, spread across VK7, VK5, VK4, VK3, VK2 and VK1. The same chasers were busy chasing the other eight VK1 summits, most operating in the lower end of 40 metres. James VK1DR on Isaacs Ridge and Andrew VK1MBE on Mt Stromlo were flat out on two metres FM dealing with fellow VK1 SOTA activators chasing precious summit to summit points. Congratulations to James for his first VK1 SOTA activation, a great effort considering the speed of operations. The Summit King was Matt VK1MA positioning himself on Mt Coree at a height of 1423 metres ASL, no problems getting a signal out. Al VK1RX at Tuggeranong Hill running QRP reported an excellent opening on 15 metres with DX contacts into south east Asia. The big climb award goes to Glen VK1FB who convinced his wife to accompany him for the six km climb (not a walk) 780 vertical metres to the summit of Mt Tennent. A huge effort Glen and congratulations on a new activation. The popularity of SOTA is growing, Brendan VK4FADI (yep QLD) was chasing points from a local park operating a K3. Great effort Brendan.

A number of activators had the pleasure of contacting Peter VK3YE operating his FT-817 and the well-known magnetic loop from Chelsea Beach, signal reports from Peter were 5-5 both ways. It's always fun chatting to Peter on a distant beach or pier somewhere around Port Phillip Bay. While on Mt Taylor Ed and party were busy chatting to the fitness fanatics, who were wondering why their regular chin-up bar on the Trig was occupied by a funny looking fishing rod (squid pole) extending six metres into the air.

Andrew VK1DA and Ian VK1DI (easy to mix up the call signs) were running a dual activation on One Tree Hill, as were Mark VK1MDC and Peter VK1IRC at Mt Ainslie. Mark and Peter were joined by SOTA newbie Andrew VK2FAJG.

The VK1 SOTA mass activation was well supported in other VK associations with fellow SOTA activators from VK3 and VK5 accessing local and distant summits with the aim of chasing valuable summit to summit points between summit activators in VK1, VK3 and VK5. A quick scan of the SOTA database today indicates each activator had at least 18 summit to summit contacts within VK1 and the possibility of three from VK3 and two from VK5. Post UTC date

Photo 2: Ian VK1DI operating on 40 m, with the FT-817 powered by a small SLA battery.

change, the SOTA chasers were back for a second pile up on each summit.

At 1130 and the SOTA chasers exhausted, it was time to plot a route down the mountains to the cars and head off to Kingston for lunch at Bittersweet, Green Square. Stories of summit activations, antennas, rigs, packs, very steep walking tracks and locals were shared over coffee and lunch. A perfect day for radio, together with a great opportunity to showcase the capability of, and having fun with, amateur radio.

Photo 3: Jim VK2LC, Glen's wife (partly obscured), Glen VK1FB, Ed VK2JI and Rod VK2LAX at lunch.

WorldWide Flora & Fauna in amateur radio

Paul Simmonds VK5PAS

Portable operation here in Australia appears to be a very popular activity. There are many amateurs who like to combine their passion for bushwalking, mountain climbing, bird watching, caravanning, and their general love of outdoors, with their interest in amateur radio.

With the advent of Summits on the Air (SOTA), the Keith Roget Memorial National Parks Award (KRMNPA) in Victoria, and the recent VK5 National & Conservation Parks Award, portable activity on the bands over the weekends has certainly increased.

There is also another program which encourages portable operation, unfortunately little known here in Australia, but very popular in Europe, the United Kingdom and North America.

World Wide Flora & Fauna in amateur radio, abbreviated as WWFF, is an international amateur radio program which encourages portable operation from designated nature parks and protected nature areas around the world.

The aim of WWFF is 'to *draw attention to the importance of protecting nature, flora and fauna*', whilst at the same time providing a fun activity for amateurs.

The Flora and Fauna movement within ham radio was initiated in 2008 by the Russian Robinson Club as World Flora and Fauna (WFF). In 2012 the program relaunched as World Wide Flora & Fauna in amateur radio (WWFF), and has undergone a major revamp.

A total of 33 countries around the world have participating national programs, offering a significant number of very attractive Awards.

The Australian WWFF National program was launched in March, 2013. Qualifying areas in Australia at this time are National Parks. Hundreds of National Parks in the various Australia States and Territories are listed on the Australian list.

The Australian WWFF program also offers an Award series. Certificates are available for 'Activators' working portable from a specified number of Australian parks; 'Hunters' who work 'Activators'; and the awards are also available to Short Wave Listeners.

The normal requirement for a valid WWFF activation is that the Activator obtains 44 QSOs. However, the Australian National program only requires 10 QSOs for an activation to be valid.

When contacting WWFF activators you may hear at the end of a QSO…'44'. What does this mean? The first '4' digit represents the four elements: earth, water, air, and fire. The second '4' digit represents the four directions: north, south, west and east.

So why not get involved next time you're out and about on your caravanning holiday, or if you have a few hours free on the weekend to explore one of Australia's magnificent parks. And at the same time get some WWFF activations under your belt.

More information on the WWFF program can be found on the WWFF global website at *www.wwff.co* or on the Australian World Wide Flora & Fauna website at *www.wwffaustralia.weebly.com*

The Australian bush can provide extreme beauty albeit, sometimes, in a rugged environment – and allows ample opportunity for amateur radio involvement in many guises.

A review of the 2013 Gippsland Technical conference

Roger Harrison VK2ZRH

No doubt about it, Australia's annual 'premier technical conference in VK' continues to deliver the goods in terms of interest, technological insights, variety, camaraderie, entertainment, value and useful stuff to buy from the smattering of traders.

For those unfamiliar with the event, GippsTech is a weekend of lectures from amateurs for amateurs, with a core focus on technologies and techniques applicable in the VHF, UHF and microwave bands (especially for weak-signal working). Lecture topics can range far and wide, from the practical (homebrew) to the postulatory (propagation), from the historical (DX glories) to the hysterical (field day mishaps), from the neophytic (SOTA) to the neological (software), from the extreme (big dishes) to the exhibitionistic (ham shows). To paraphrase Forest Gump: GippsTech is like a box of chocolates, you never know what you're gonna get!

Held at the Churchill campus of Monash University each year, GippsTech 2013, held over 13-14 July, was the 16th consecutive event. Lecturers and attendees came from VK1, 2, 3, 4, 5 and 7 and included Advanced, Standard and Foundation licence holders. Attendance this year reached a new high of 110, according to chief organizer and compere, Peter Freeman VK3PF (your erstwhile *AR* Editor – how does he do it?). I was pleased to see two fellows-in-arms attend GippsTech this year for the first time – Trash VK2XSO and Ian VK3XCD. This year's contingent of VK4s numbered nine hardy souls who braved the Victorian winter, hiring a small bus to perambulate their persons from motel to venues. Smart idea.

The Conference opened with a few short eulogies in memory of past prominent figures from the VHF-UHF scene who became silent keys in the past year: Eric Jamieson VK5LP, Ray Naughton VK3ATN and Neil Sandford VK2EI. Their passing marks the passing of an era in Australia's VHF-UHF history.

Here follows my views on the 19 lectures presented this year, in order of appearance.

50 MHz: what's waiting out there?

Presented by Andrew Martin VK3OE and yours truly, the title sums up the theme that, while 50

Photo 1: The attentive audience in the lecture theatre. Photo by Chris Morley VK3CJK.

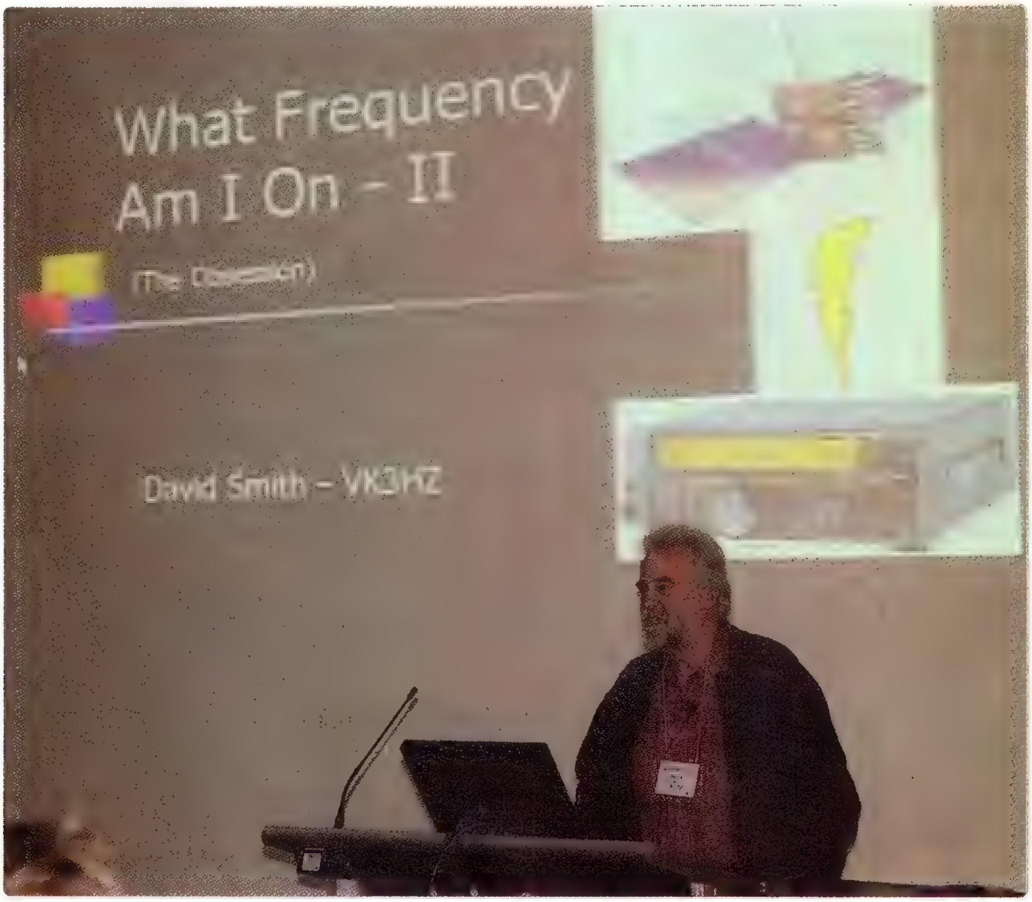

What Frequency Am I On - II
David Smith – VK3HZ

Photo 2: David Smith VK3HZ commencing his presentation. Photo by Chris Morley VK3CJK.

MHz DXers have amassed many achievements over the decades since the magic band was allocated following WW2, it *hasn't* 'all been done' on 6 m and there is yet more to be explored. I presented a recap of the generally known beyond-the-horizon propagation modes – including a global view of sporadic E occurrence, and introduced new propagation modes to be explored. Andrew VK3OE followed with an exposition on recent developments in practical tools for exploring 6 m propagation – Chirp Backscatter Radar in monostatic mode (your own 'personal propagation explorer'!), including the necessary software and accompanying hardware. As 6 m is at a propagation waypoint, there are now more opportunities to make new discoveries, concluding that 6 m DX is the most fun you can have with your clothes on! Andrew and I will leave it to others to pass on their impressions of our presentation.

What frequency am I on?

One would be forgiven for thinking that David Smith VK3HZ, a standout microwaver and homebrewer extraordinaire, should have worked this out by now. But, as microwave activity and technologies progress relentlessly, so does the need for frequency precision. These days, knowing your frequency to 'ten to the foompteenth' is barely enough on 10 GHz, and doesn't cut the mustard on 24 GHz and beyond. David is a GippsTech veteran and always has well-compiled, thoughtfully prepared presentations that intermixes salient theoretical aspects of his chosen topics necessary to support the practicalities. You get the benefit of his extensive experience. And his presentation this year was right out of the same mould, basted with a little of his self-deprecating humour. Guess I'll have to throw out my Lecher Line wavemeter.

Inaccuracies that will lead to a deficiency in your system's performance

I'm convinced Doug McArthur VK3UM is an insomniac who uses the extra hours this affords him to code, recode and update his software suite for VHF/UHFers and moonbouncers. Doug's work is world-leading and relied on by many operators the world over. A high performance VHF/UHF DX or moonbounce station is a complex system made up of many elements and subsystems that must work together to achieve what you planned for and expect. That's where Doug's software comes in, all available free for downloading from his website at *www.vk3um.com* I am reminded of the tradies' motto: no matter how good the tools, they won't do the job for you. This year, Doug gave us a rundown on a range of hints and tips to keep in mind when using his software to plan your high performance station or characterize what to expect when determining your system's performance. Always good value.

Icom Multi-Send

Adam Maurer VK4GHZ, erstwhile developer and publisher of the popular VKLogger (*www.vklogger.com*), and microwave activity promoter, has designed and produced a neat and highly functional add-on for the IC-910 all-mode VHF/UHF transceiver so that the appropriate afterburner for the transmit band you select is keyed automatically – 2 m, 70 cm or 23 cm. It doesn't use the rig's CI-V interface, which has limitations for this sort of application. The Multi-Send uses isolated relay outputs to activate external amplifiers used with the IC-910 and eschews having to manually enable and disable them. Well thought out and well-executed. It seems GippsTech was a 'launch event' for the kit, now available via *http://vk4ghz.com/icom-ic-910-multi-send/*

24 GHz EME: let's consider a few physical aspects.

Alan Devlin VK3XPD is a microwave stalwart of note. When he gives a presentation on his experiences with some project or other, he gives it warts and all – the triumphs and the tragedies, no matter if the latter are at his own expense (and I don't mean dollars). Alan's lavishly illustrated presentation showed off his eminently practical approach: lash it up and give it a go. The use of ladders, stray ropes, discarded wood and a sizeable dish that had seen better days to fashion a 24 GHz EME station is but a modern version of the 19th century love of 'string and sealing wax' science and engineering. Just don't tell the local council or the alien-spies conspiracy theorists. Alan's GippsTech lectures are always solidly practical, inspiring and entertaining.

Small station EME at 10 and 24 GHz using digital modes

'Mr Digital', Rex Moncur VK7MO is resolutely indefatigable in pursuing contacts using any and every digital mode, from terrestrial over-the-horizon paths on the VHF-through-microwave bands, to moonbounce from portable locations. He's been at it for more than a decade. If the entire rig and antenna system won't fit into or on his station wagon, it's pared back until it will! Rex has been travelling various remote Australian grid squares playing moonbounce with his latest 24 GHz rig based on an ex-commercial 1.1 metre diameter dish mounted on a cheap tripod from Bunnings. Rex added a separate 10 GHz setup for a bit of variety. Sites along the Great Australia Bight are now well-known among the world's microwave moonbouncers. Rex had the rig set up in the coffee room and there was always a small crowd examining it and asking questions. The practicalities of fielding such small stations at remote locations are non-trivial. Nor is getting bogged while doing it!

An update on the ACMA EMR requirements and their implications

A current 'hot topic' (pardon the pun) in some quarters, Doug McArthur VK3UM took the opportunity afforded by GippsTech to explain the latest update to his EMR Calculator software tool and what the ACMA expects of every amateur when it comes to

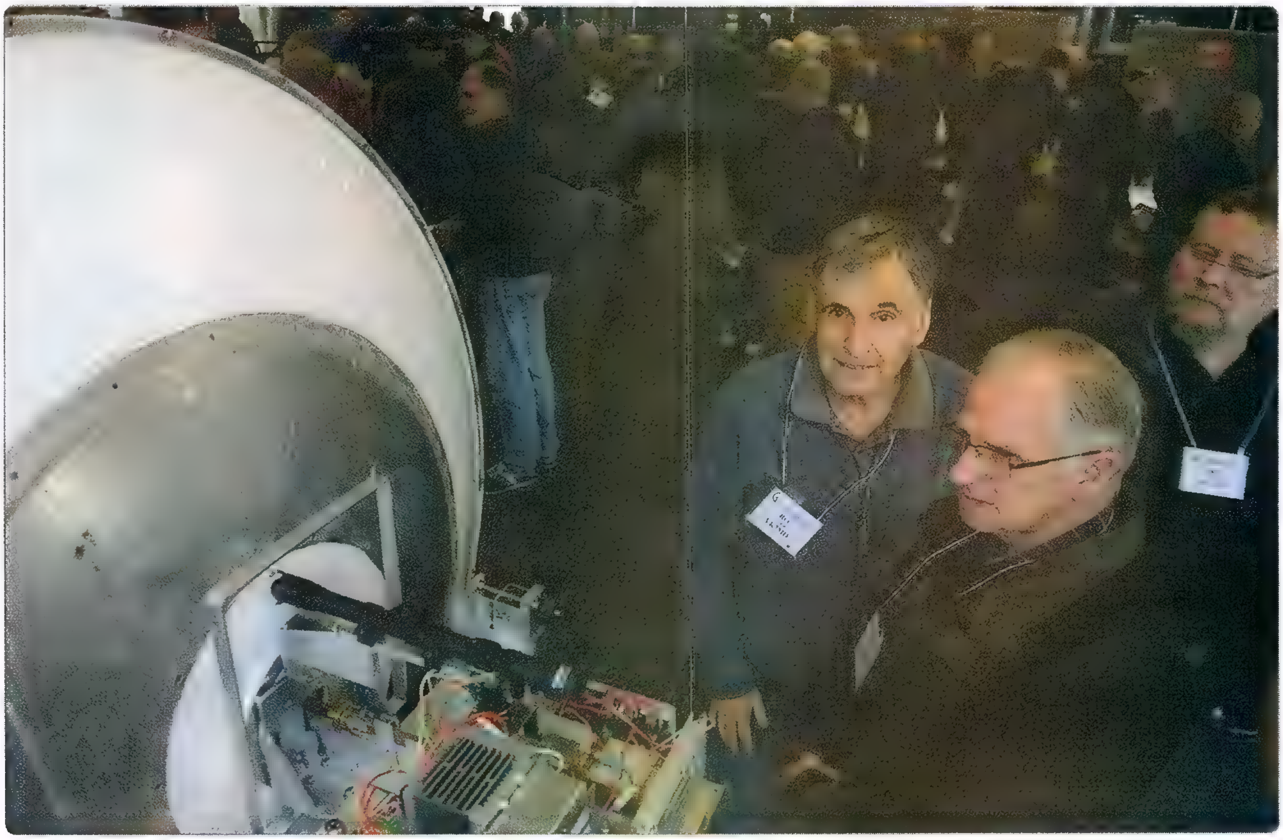


Photo 3: Rex Moncur VK7MO discussing his 24 GHz portable rig. Photo by Chris Morley VK3CJK.

meeting the obligations inherent in their licences in relation to electromagnetic radiation (EMR). If you thought the ACMA's EMR requirements for amateurs' stations related only to 'high power', you would be mistaken. Doug's EMR Calculator was updated in consultation with the ACMA to meet the recent clarification of its policies regarding station EMR assessment. Very timely.

Lightweight antennas for VHF backpack portable

Wayne Merry VK3WAM has been known to enjoy the odd field day and operating from hilltops; Summits on the Air (SOTA) has become a passion with him. Wayne regaled the audience with his experiences in planning and building antennas for SOTA activation of hilltops and other summits, all carried onto location in a backpack (no Sherpas allowed!). In some situations it can be difficult to make the antenna gear lighter than the rig to be used! Ingenious use of wire and fiberglass squid poles for HF can perform remarkable wonders. Several SOTA enthusiasts were noticed in the carpark outside the lecture theatre. Check out Wayne's blog at: *http://waynemerry.wordpress.com/*

A lightweight Yagi for 2 m

Neophyte SOTA enthusiast Peter Freeman VK3PF complemented Wayne's lecture by describing a collapsible 2 m Yagi using readily available hardware. Peter's lectures are always forthright, practical, detailed and laced with useful anecdotes. The speed with which his little Yagi went together was remarkable. Ingenuity rules!

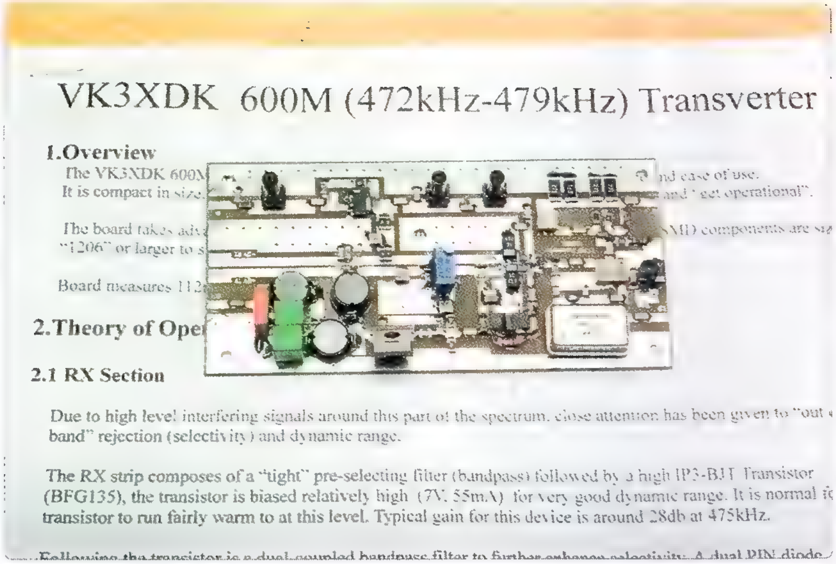
Single chip microwave oscillators

Bryan Ackerly VK3YNG is a GippsTech veteran, probably best described as an experimenter's experimenter. Innovative to a fault. Always looking to try a new way or better an old one. Bryan has done some remarkable work recently, surveying low-to-moderate cost high performance oscillator chips for microwave applications, comparing and contrasting features and functions of a variety of comparatively new semiconductor technologies. This lecture set my thoughts racing off in many directions. I'll have to investigate and review my plans for 23 cm and 9 cm rigs, methinks.

Finding focus

Last year, I described Russell Lemke VK3ZQB as evincing the air of the professional engineer: knowledgeable, experienced and bluntly pragmatic. His GippsTech lectures are spiced with that laconic Australian humour as is found in Henry Lawson's story, The Loaded Dog. Russell described his many experiences determining

Photo 4: The breaks were filled with animated discussions, often whilst examining items presented for display. Photo by Adam Maurer VK4GHZ.



VK3XDK 600M (472kHz-479kHz) Transverter

1.Overview

The VK3XDK 600M nd ease of use.
It is compact in size. and " get operational".

The board takes adv SMD components are siz
"1206" or larger to s

Board measures 112

2.Theory of Ope

2.1 RX Section

Due to high level interfering signals around this part of the spectrum, close attention has been given to "out
band" rejection (selectivity) and dynamic range.

The RX strip composes of a "tight" pre-selecting filter (bandpass) followed by a high IP3-BJT Transistor (BFG135), the transistor is biased relatively high (7V, 55mA) for very good dynamic range. It is normal fo
transistor to run fairly warm to at this level. Typical gain for this device is around 28db at 475kHz.

Following the transistor is a dual-coupled bandpass filter to further enhance selectivity. A dual PIN diode

Photo 5: One of the items on display – an elegant transverter for the 600 m band, designed by Graham VK3XDK. Photo by Adam Maurer VK4GHZ.

the focal point of microwave dishes using optical techniques, from the improbably simple through to the elegantly sophisticated. More string and sealing wax science and engineering. Great stuff. I will definitely have to try some of his techniques.

On pattern effects of Yagi boom droop

Curiosity obviously got the better of Glen English VK1XX when he pondered this subject a little while back. He gave us the benefit of results from a series of EZNEC antenna simulations of droop due to gravity on variously-sized long(ish) Yagis. There may be occasions when it matters, or not. All in all, nice information to file away in the back-brain to bring out when it could be useful.

Impedance transform and use of split-tube/slotted baluns

For a new father, Glen VK1XX must be solving problems in Euclidean geometry in his head to keep himself awake while trying to get the baby to sleep in the early morning hours. The split-tube coax feed for a dipole is one of those long-lost engineering problems from yesterday that spearheads debates on internet forums every so often. It came up in discussions on the VK-VHF Reflector recently. Glen gave the GippsTech crowd an illustrated explanation of how it's supposed to work – much more enjoyable than the dry mathematical treatises seen in textbooks of the past.

Some amateur history viewed through QSL cards

Michael Goode VK3BDL was inspired to get his licence by his grandfather. Having succeeded in that in the 1960s, Mike set out to collect QSL cards, not always by the 'traditional' method of making contacts. Mike gave the audience a tour through his QSLs from experimenters of the early days (local and foreign) through to the modern era, including many significant cards from Australian VHF-UHFers. The best I can manage among my paltry collection is a card from Hans Ruckert VK2AOU, of antenna fame.

An alternate approach to using the FE-5680 rubidium standard

Converting junk to gems is one of Russell VK3ZQB's specialties, it seems. These frequency/timing standard devices are widely available via eBay and other sources. Many experimenters have described how these units can be used around the shack (e.g. synchronizing your test gear), but many descriptions are not always practicable. If finding a 'new way' is the latest political mantra, Russell has adopted it and applied the principles to practical purpose for the inveterate experimenter.

Friedrichshafen

It's not a swear word in a foreign language. It's Europe's equivalent to the US Dayton Hamvention or Australia's Central Coast Field Day (well, maybe not). It's big. It's busy. There's lots of stuff to buy – especially useful microwave stuff. Many traders, many lectures. Alan VK3XPD took us on a tour of this year's event, from his own point of view.

MAP65 in action on 23 cm

Chris Skeer VK5MC (aka 'the man with the big dish') has been busy at the moonbounce game since before disco was a craze. He adopted the software defined radio (SDR) mantle a while back and has lectured on it at GippsTechs past. MAP65 is a specialized software application from Joe Taylor K1JT, specifically for use with SDR hardware and a PC in conjunction with a standard SSB transceiver. It is a special implementation of the JT65 digital protocol. MAP65's features offer powerful advantages for Moonbounce on 2 m, 70 cm and 23 cm. Chris has been exploring its use on 23 cm Moonbounce, using his big dish. An inspiration.

The battle for 2300 MHz

Yours truly put up a presentation on the background to the WIA's submission to the ACMA concerning its intention to withdraw 2300-2302 MHz so that 2300-2400 MHz could be offered up for spectrum licensing.

GippsTech – this is hard-core amateur radio at work and play! Add *www.vk3bez.com* to your browser's bookmark list and visit often from early 2014.

Over to you

Response re Batteries on page 37 of "Amateur Radio" July 2013

I read with interest Rodney Champness' comments regarding the rather less than expected results he obtained as a result of his capacity testing of lead acid batteries.

Having been involved in the communications, telecommunications and broadcast television industries since the early 1970s and now, as a full-time Grey Nomad, I have been involved with batteries and their useful capacities for well over 40 years.

Firstly let me say that Rodney's method of testing is very sound. Timing the discharge at a known rate to a predetermined terminal voltage provides a sound measure of actual deliverable battery capacity.

What did surprise me is the response he received from his battery suppliers. The supplier who said "…50 to 60%…" was probably the closest to being correct for a new battery. This is borne out by Rodney's own measurements. No surprise there, but the fact that the supplier did not explain why this is the case is the disturbing part because it shows the supplier does not understand his product.

A search of either hard copy textbooks or the internet will provide information on the basic chemistry and construction of lead acid batteries. There are undoubtedly other readers out there with far more detailed knowledge than I and battery construction varies greatly in the fine detail. However, I provide this overview for the benefit of those with little knowledge of the subject.

A lead acid battery is a combination of cells, each cell having a terminal voltage of around 2 volts per cell regardless of size, shape or capacity. When a cell is produced, both the positive and negative plates of the battery have a supporting grid stuffed with exactly the same chemical paste. Each cell is assembled with alternate "positive" and "negative" plates separated by liquid permeable insulating barriers called "separators" and this assembly is then placed inside the cell case which is ultimately filled with a conductive fluid called the "electrolyte". This electrolyte is 35% sulphuric acid and can be either a liquid or gel depending on the cell construction. The assembled cell is then charged to chemically "form" the plates into positive and negative chemistries.

Starting batteries and deep-cycle batteries have, for a given amp/hour (Ah) capacity, a similar amount of lead paste per battery as this chemical storage ultimately determines the electrical storage capacity. However, the distribution of the paste is very different in that the number and thickness of the individual positive and negative plates varies greatly between the two applications.

Starting batteries have a large number of thin plates to provide the maximum surface area for ion exchange resulting in higher current flow capability. Starting batteries will typically have 13 to 19 plates and a high CCA (Cold Cranking Amp) number typically 700 A plus. Whilst they are capable of high currents, they cannot provide this for very long because the material in the thin plates converts back to the discharged chemistry very rapidly.

Deep-cycle batteries on the other hand have a lower number of much thicker plates to provide current in a "slow release" form, albeit at a lower current due to the lower surface area and hence lower current density.

When the plates are formed during the manufacturing process, they typically only convert a thin coating on the surface of the plate paste to the "charged" chemistry. Starting batteries therefore generally show slightly higher initial test capacity than deep-cycle batteries of the same capacity because a higher percentage of material has been converted to the working chemistry.

The good news is that this low capacity is only temporary if treated correctly. Just as a healthy exercise regime for us humans can build up our strength and endurance, so it is with lead acid batteries. Had Rodney charged his battery up again and re-run his test, he would have found that the capacity would have increased some 5-10%. Charge it again and re-run the test and it would improve again. Continuing to do this "cycling" will result in a battery which will ultimately provide rated (or better) capacity.

This cycling is even more important with deep-cycle batteries because the paste is thicker in the plates and each charge/discharge cycle will progressively "form" more of the deeper plate material until it is all ultimately converted to working chemistry. This is true for either wet (flooded) types or gel types. "Low maintenance" batteries are flooded cells with a greater reserve of electrolyte and clever hydrogen/oxygen recombination technology to convert most of the gas liberated during charging back to water to maintain electrolyte levels. It is important that intelligent multi-stage chargers be used with any flooded or gel "sealed" construction to minimise uncontrolled gassing and subsequent loss of electrolyte and capacity.

In the early 1970s, I installed two banks of 2000 Ah/2 V cells to power a high power microwave site in New Guinea. Each 2 V cell held about 20 litres of acid! We had to cycle the batteries about 20 times before they came up to rated capacity, which was a requirement of the contract. This task alone took about three weeks using a pair of homemade dummy loads wound with 8 gauge soft fencing wire on wooden frames, the contraptions looking more like cocky cages than anything electrical.

One final note. It is important that lead-acid batteries are not discharged more than 50% of capacity on a regular basis or they will suffer an early death. This means a 120 Ah battery should not be discharged beyond 60 Ah. That said, deep-cycle batteries will generally cope better with deep discharge than starting batteries, but it is imperative that they be charged fully as soon as practical after use. Be kind to your lead acid batteries and they will serve you well, abuse them and they will let you down at the most inopportune time.

Regards,

Bob Ecclestone VK1ZRE

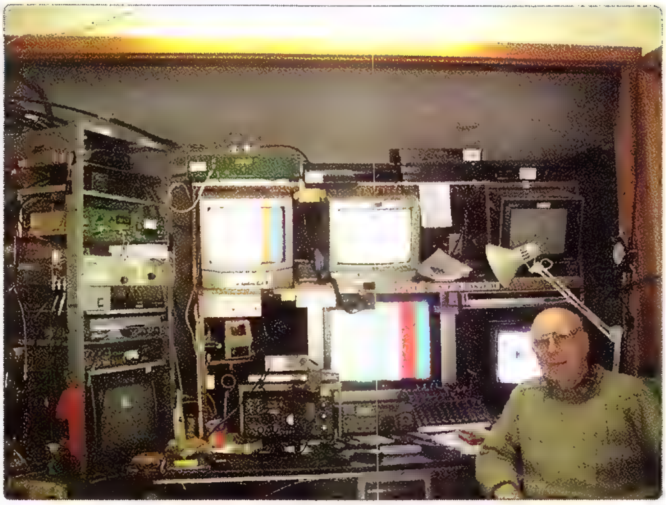
Plan Ahead

Adelaide Hills Amateur Radio Society Inc HAMFEST | 3 November

Rosebud RadioFest 2013 Southern Peninsula Amateur Radio Club | 24 November

Silent Key

Barry Cleworth VK5BQ (ex VK5ZBZ)



Barry passed away suddenly on 1 April 2013. Of his many lifelong hobbies amateur radio was number one, with the irresistible combination of the application of technical skills and knowledge and the rewards gained from friendships made within the radio amateur community.

Barry received his full licence in September 1960 receiving the callsign VK5BQ, and became a full member of the WIA in 1961. That same year he received a certificate of award on having established two way radio communication with all states of Australia on 50 MHz. Among other achievements of note are included:

- Gained first place in the phone section of the 1959/60 Ross A Hull Memorial Trophy VHF contest, scoring 802 points, under his first call sign VK5ZBZ.
- Gained a VHF (WAD – Worked all ZL Districts) award from NZART in 1960 for two-way radio communication on the 50 MHz (or 50 Mc as it was then) band with at least one amateur transmitting station in each of the four radio districts in New Zealand, again as VK5ZBZ.
- VHF Century Club certificate awarded in 1962 for having established two-way phone radio communication with one hundred stations on the 50 MHz band.
- The leading VK5 station in the Radio Society of Great Britain 21/28 Mc telephony contest in 1964.
- A Remembrance Day contest Certificate for Outstanding Performance in gaining first place in the Phone section of the 1965 contest, scoring 741 points, and in 2000, scoring 417 points.

In later years Barry became interested in ATV, becoming a member of the SA Amateur Television Group in 1991. In 2002 he received a Certificate of Achievement from the WIA for his contact with Ben VK5RD on 28/11/2002 which set a new Australian ATV distance record for the 5.7 GHz band, over a distance of 111.1 km.

The mid to late 1990s saw Barry become involved in Radio Scouting and the lounge room at his QTH at Stansbury on Yorke Peninsula was turned into a radio shack/studio for local Scouts, Brownies and Guides to participate in Jamboree on the Air (JOTA). Through the use of his VHF and amateur television facilities local children made contact with other Scouts and Guides around Australia and countries as far afield as Columbia, Germany, India, Lithuania and north America. A newspaper article on the JOTA reported that the children found amateur television particularly fascinating because they could view themselves and the person they were talking with and hear their own voices coming back to them over the television set. The JOTA participants not only earned a badge for their efforts but also learnt about Morse code, semaphore and the phonetic alphabet and used these for other JOTA activities.

As Barry's interest in ATV grew, he worked towards a relatively complex ATV full duplex hookup allowing eight amateur radio operators to enjoy lively round table discussion with video, the success of which was quite gratifying. This involved four stations plus one digital ATV repeater in continual transmit mode, and four additional stations in receive mode. An interesting aspect of this contact was that there were no less than five microwave bands in use, namely 1250 MHz, 2.4 GHz, 3.4 GHz, 5.76 GHz and 10 GHz. The distances involved varied from 60 to 87 km, with the locations of several domestic stations not being very suitable for microwave transmissions. Audio liaison and intercommunication frequencies involved the two metre and 70 cm bands. The ATV signals emanating from Barry's QTH were capable of being received by all the other stations simultaneously. Picture and sound signals could be sourced from cameras at VK5BQ or more often via a relay from VK5ZTS, VK5AO or VK5RD. Relay facilities at VK5AO and VK5BQ were such that routing changes were conveniently accomplished by the touch of a single button. A signal originating from Tom VK5ZTS was converted to digital format by the digital repeater VK5RWH. The 1283 MHz digital signal was received directly by several stations including Maitland Lane VK5AO, who then relayed it to VK5BQ on 5.76 GHz who then distributed the signals to other members of the hookup via 1250 MHz and 2.4 GHz. Most of the group's transmitters had been built up from kits sourced from Mark (Mini-Kits) VK5EME. Barry thoroughly enjoyed the advantages of ATV and the camaraderie resulting from the twice daily ATV skeds and he is sorely missed by the group.

Contributed by Julianne Cleworth.

Help us

Contribute to the Weekly WIA News Broadcast. See our website for details.

www.wia.org.au/members/broadcast/contribute/

ALARA

Margaret Blight VK3FMAB – Publicity Officer

In this issue we have news from some international YLs. It is great to hear from them and learn about the activities they are involved in.

We recently heard from our friend Marita OH5KIZ in Finland thanking us for our hospitality during her visit to Melbourne. She intends to be in Roskilde for the SYLRA meeting and would like to circulate the information that the Scandinavian Activity Contest SAC will be held on 21/22 September on CW and 12/13 October on SSB. While it is not a YL contest, the world will be working the Scandinavian stations (Denmark, Norway, Iceland, Sweden and Finland). Marita hopes to be able to reach some Australian stations, conditions permitting. For further information go to *http://sactest.net/blog/*

Maggie Koi H44MK – The only licensed amateur operator in the Solomons

I'm Maggie Koi H44MK. I come from the Solomon Islands. I grew up in a village called Kwai Island east of Malaita. Malaita is one of the provinces here in the Solomon Islands.

I grew up in a culture where girls or women always stayed at home to do daily activities such as gardening and caring for the little children while the men's job was catching fish for the family. We always show respect for our chief on the Island and never do things that are against our culture.

Perhaps my interest in amateur radio is a little unusual for a woman in the Solomons but this hobby brings me to people around the world and helps others to know my QTH. I started out in radio by attending an amateur radio course in Honiara in 2002 for about seven months. The course was advertised in the Solomon Star Newspaper and it sounded like a good idea so I went.

I obtained my radio license at the end of 2002 and chose my call sign of H44MK. My first time to get on the air was not really good for me. I held the microphone with a shaking hand. I didn't know what to say to the calling station. I nearly spoke my Solomon Island pidgin dialect rather than English. As time moved on I started to learn the right procedures and over time felt more comfortable.

Currently I accompany Ralph Kluge H44RK with his beautiful wife Penny on Liapari Island Oscar Charlie 149 (IOTA OC-149). Every evening I call CQ on the 15 metre band. I've found it a bit hard sometimes when there's a pile up on the air, especially to get the right suffix of the calling station. Now I learn new things about ham radio while I'm here in this little island of Liapari.

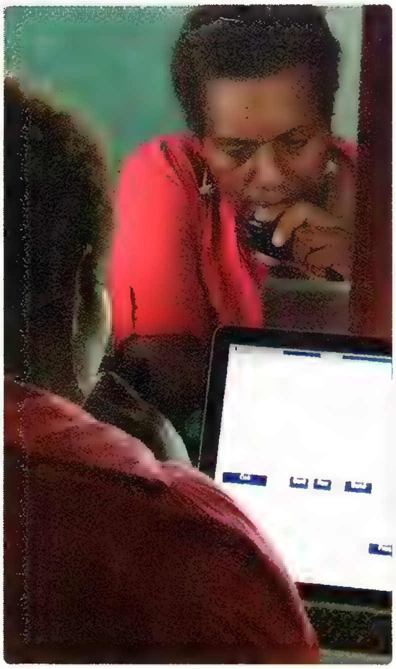


Photo 1: Maggie H44MK.

We are about to start a Solomon Islands DXpedition, starting from Liapari and ending in Temoto (west to east). I'm especially looking forward to our stop on Sikaiana Island. Even though I have helped lots of DXpeditions here in the Solomons, this will be the first time I have participated in one with the expatriate radio operators. After we have finished the H44IOTA trip I've got more ideas, which I'm going to share with the school teachers here in the Solomons.

The Solomons has many different remote islands and in the villages HF radio is very important. We can't always depend on mobile service; because where there's a big cyclone or tsunami it can destroy the local towers. Only HF radios will be useful during times of disaster. Having and using HF radio would be a cheaper and better way for villages to communicate and will help save lives in times of trouble. Radio could also even be used to teach children in places with no schools.

VK4 news - H44 IOTA DXpedition with a difference

Lyn VK4SWE

A DXpedition with a difference - leaving more than footprints in the sand and QSL cards - the team will interact with islanders along the way and assess their needs so that other groups in the region can then continue with assisting these isolated communities, particularly in their communications, and particularly radios - easy to maintain and less expensive to operate than putting mobile phones in isolated areas where cash is not readily available for 'top ups'. Hi Hi.

So far, three IOTAs have been activated and there are another five on the list - just waiting for confirmation from IOTA that all was OK with the last one due to a fall-out in the team! Please don't print that! But yes, things got a bit sticky there for a while - however Ralph is in Honiara now loading the boat for the trip to Temotu to install the safety communications for the islanders there - the humanitarian side of the project.

Photo 2: L-R: Pam VK4ON, Sue VK4ST, Catherine VK4GH, Val VK4VR, Micheline VK4FMGE, Bambi VK4FADO (soon to be VK4PYL) and Nicki.

Further news from VK4

Micheline VK4FMGE

On a recent Saturday we met up with the Brisbane and Gold Coast ALARA YL's at the Hogs Breath Café in Logan. We had a lovely lunch, a nice time and chatted for nearly four hours.

VK3 news

ALARA President Jean VK3VIP has returned from a visit to New Zealand. While there she had the opportunity to catch up with some WARO members and was able to talk to others on the air.

There was a good turnout of ALARA helpers at the Gippsland Gate Radio Club sale at Cranbourne, among them Dianne VK3FDIZ, Jean VK3VIP, Pat VK3OZ and Susan VK3UMM.

A luncheon was held in July to celebrate the 38th birthday of ALARA. Despite the day being a little cold and windy, those present had a most enjoyable time. We were also privileged to view the classic video by the late Tony Hancock of 'The ham radio operator.' We certainly enjoyed a lot of laughs over that and were fascinated to see the amount and size of the early equipment used. Many thanks go to our hosts Jenny VK3WQ and OM Peter. Those present included Dianne VK3FDIZ, Jean VK3VIP, Jenny VK3WQ, Susan VK3UMM, Pam VK3NK, Marg and Margaret VK3FMAB.

Photo 3: Jean VK3VIP, in the middle, with WARO members Lynette ZL1LL on the left, and Marlene ZL1MYL on the right.

VK5 news

After several months when attendance at the monthly luncheons was poor, in July there were eight of us plus Christine's daughter, grand-daughter and great grand-daughter. Christine has been bragging about the new baby so everyone was happy to see Maggie.

But July is also ALARA'S birthday month when there were eight YLs and four OMs to toast the birthday. There was a small hiccup. When we arrived at the venue it was to find that they had no power. No lunches would be served there that day. A couple of phone calls found us an alternative but only if we could be there and order our meals before 12.30.

Luckily the new hotel was not far away so we were able to order as required. The food was great, the company was great and a good time was had by all. The photo is suffering from the light pouring in through a skylight but we managed.

Happy Birthday ALARA.

WIA Contest Website

Keep up to date with all of the major Australian contests, including rules and results, at the WIA Contest Website at: **www.wia.org.au/members/contests/about**

VK3 news Amateur Radio Victoria

Jim Linton VK3PC
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Support the organisation

Often when spending hard earned cash the question asked is whether the expenditure is necessary and provides real value for money. This is the case for many who think twice before giving financial support to Amateur Radio Victoria, and want to know what is in it for them and the future of the hobby. Rather than look at personal benefits alone consider all activity and the community benefit of an organisation.

Amateur Radio Victoria's main efforts include the VK3 QSL Bureau, being a contact point, maintenance of Australia's largest network of repeaters and beacons, and upgrading facilities to make them more cost effective.

The state-wide organisation is the only one in Victoria that has consistently run Foundation licence classes and Standard Bridging courses. It has also been helping those who have had regional courses and assessments.

The organisation, founded in 1911, has always been a leader in bringing much needed new people to our hobby.

Each year it has displays and activities for members and the general public. These include the WIA public relations Field Day, military vehicle displays, ANZAC Day, the International Lighthouse & Lightship Weekend, and the Centre Victoria RadioFest at Kyneton.

For paper-chasers we have two awards, both aimed at stimulating portable activity, and others may be introduced when needed. Catering for the do-it-yourself radio amateur, it hosts the Homebrewers Constructors Group monthly gatherings.

It provides support to the Melbourne and Geelong, and Bendigo central Victoria amateur television repeaters, and maintains the D-STAR repeater VK3RMM at Mt Macedon.

Looking ahead, the organisation is talking about all of its current activities. Consideration is also being given to a special event station, a repeater coordinators gathering, and completion of the Mt Stanley site lost during the Black Saturday Fires. Contesting and other events are being discussed.

In support of all these activities is the website, worked on virtually daily to keep it dynamic. Among the enhancements are an online payment ability and other general improvements.

The weekly VK1WIA broadcast is transmitted from a dedicated facility and with a call-back.

It all takes considerable voluntary time, the use of modern software and some expense. For the individual it still costs less than five cents a day.

The subscription, unchanged for at least a decade and very affordable, is $30 ($25 Concession) for two-years Full or Associate membership.

Assistant Secretary and Treasurer

One or two volunteer members are being sought to become under-studies to the current Secretary/Treasurer Ross Pittard VK3CE, as part of succession planning for those roles.

While the work involved for both positions is not onerous, and meetings are held usually five times a year, it is important to the well-being of the organisation.

For further information on the requirements please contact the Secretary/Treasurer at *vk3ce@amateurradio.com.au*

KRMNPA activity planned

A number of activations under the Keith Roget Memorial National Parks Award (KRMNPA) are planned to happen in the period September 8-13, giving an opportunity to work them.

The KRMNPA Manager Tony Hambling VK3VTH has announced he will be operating portable from the National Parks, is looking for many contacts and hopes a few others will join in the activity.

His program is: September 8 - Little Desert 0600Z to close, September 9/10 - Wyperfeld 0600Z to close, September 11 – Murray Sunset 0400Z to 0600Z and Wyperfeld 0900Z to close, September 12/13 Grampians 0600Z to close. The main frequency is 7.100 MHz with 80 m and 20 m used if requested or to meet demand. Please check out the website for any changes or additions. The full rules are on the website.

Standard Licence theory bridging course

Enrolments are open for another Standard licence theory course that starts next month on Wednesday nights at Ashburton and ends with a revision Saturday and assessments on Sunday.

To enrol you must already have a Foundation licence as the quality instructor Kevin Luxford VK3DAP/ZL2DAP covers the additional knowledge of the Standard licence syllabus.

Those taking part commit to attend training every Wednesday on

October 2, 9, 16, 23, 30, plus the weekend of November 2 for revision and November 3 for assessment day.

The course costs $120, to be paid in full on the first night. Candidates will also need to pay on assessment day for the Theory and Regulations assessments, WIA callsign recommendation and ACMA licence fees.

To help with the Regulations assessment you should read what is required by visiting *www.amateurradio.com.au/licence/regulations*

To enrol, or for further details, contact the Education Team Leader Barry Robinson VK3PV at *vk3pv@amateurradio.com.au* or 0428 516 001.

VK1news

Nic Smelt VK1NS

This is VK1 calling. No, not an exotic island somewhere in the Indian or Pacific oceans, but the Australian Capital Territory. It has been a while since we have had a news column in *AR*, so we thought we would start off by giving an overview of the ACT.

The Australian Capital Territory was selected in 1908 to be the seat of federal parliament for the newly federated Australia. However, it was on 12th March 1913 that Lady Denman, wife of the Governor General, announced that the nation's capital would be called Canberra - and this is why Canberra is celebrating its centenary this year.

Canberra is an entirely planned city, with the main layout of the city's parliamentary triangle and surrounds designed by Walter Burley Griffin. If you want proof of it being a planned city, when people first arrive in Canberra they find it hard to locate supermarkets and service stations as the local ordinances have them typically tucked away from sight, off the major roadways. At 100 years old, Canberra is just beginning to grow into itself, and shedding the previous (albeit probably deserved) tag of 'boring'. Canberra still predominantly employs public servants, but ironically you will see more of the Federal politicians on TV than in your day to day life here. Canberra is at a relatively high altitude of approximately 570 metres, which along with the winds up from the Snowy Mountains explains the bitterness of our winters. However, we also get quite warm summers.

Since 1956, ACT operators have been issued with VK1 callsigns. Before this date VK1 was assigned to the Australian Antarctic Territories. VK1's largest amateur radio club is the Canberra Region Amateur Radio Club Inc. (CRARC) with just over a hundred members. The club provides a variety of services to the local region including repeaters on two metres and 70 cm, a D-STAR repeater, two metre and 70 cm IRLP nodes, regular foundation licence courses, a QSL bureau service and a WIA national news re-broadcasting service.

Of interest to callsign hunters: CRARC has licensed the special event callsign VI100ACT to celebrate 2013 being the 100th anniversary of Canberra's founding. This callsign is being rostered out for regional operator's use until the end of December. But more on that next month

The club has its general meeting once a month on the third Wednesday evening of the month. We usually have a guest speaker and the topics are always of great interest, such as DXpeditions, SDR, SOTA, battery varieties to name a few. If you are visiting VK1 please see our website for details and drop in to say 'G'day.'

Aside from the club and its activities, operators in the ACT are involved in some very interesting activities. SOTA is a popular new activity in the ACT, hardly surprising when Canberra is surrounded by very accessible summits. WICEN (ACT) is also very active and is an essential service provider to many 'National' events held in Canberra that seek our communications assistance including annual car rallies, cycle races, endurance horse riding, carriage driving and two day walks just to name a few. Much more on these in the VK1 updates in the months to come.

WIA 2014 Callbook

Available in October

VK3news Geelong Amateur Radio Club

Tony Collis VK3JGC

The GARC 2013 Solstice Dinner

This annual event, normally held at the club house, was moved to the Carrington Hotel in Geelong as it also represented the clubs 65th year since its inception in 1948.

Mark Tell VK3XMT, currently with the ACMA in their Field Operations Section, gave a Powerpoint presentation on 'Establishing humanitarian telecommunications in a war zone'. Mark has been involved in establishing telecoms in 35 countries over the last 15 years; the extent of which has been extensive, covering fundamental power generation for the equipment, PABX telephone systems, satellite communications and terrestrial communications, using repeater stations.

Photo 1: Mark Tell VK3XMT.

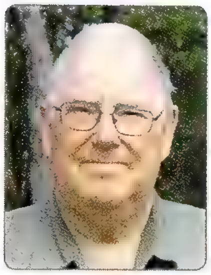
The scope of Mark's presentation covered his time in Afghanistan and Iraq, working for the UN. In both countries establishing communications for both government and non-government organisations was subject to agreement with local militia. Whilst never under direct combatant fire the presence of IED's was always a potential danger especially around communications towers. Most of the repeater stations antennas were mounted on grain silo's and communications equipment often housed in tents nearby, guarded by the local militia.

Photo 2: Presidents Nik VK3BA (GARC) and Barry VK3MBW (GREC).

The dinner was organised by Jenni VK3FJEN, Lou VK3ALB and Bruce VK3HAV and had 50 attendees including members of our sister club in Geelong, the Geelong Radio and Electronic Society (GRES).

During the course of the evening a small auction took place with Chas VK3PY conducting the bidding; one item of which was a World War 2 pilots' leather flying helmet. Jenni VK3FJEN provided the winning bid. At this stage it is unclear what action the Geelong Fashion Police will take regarding the blatant wearing of this antique head gear in a public place!

Photo 3: Jenni VK3FJEN and Chas VK3PY.



VK2 news

Tim Mills VK2ZTM

e vk2ztm@wia.org.au

Activity this month at ARNSW will be a Foundation course over the weekend of the 21st and 22nd September with assessments for all license grades on Sunday 22nd. Bookings for all activities required by an email to *education@arnsw.org.au* Sunday the 29th will be the next Trash & Treasure at the VK2WI site. Check out major items available on the ARNSW web site *www.arnsw.org.au*

Waverley ARS moved their intended September Foundation weekend to August. On Sunday 15th September Westlakes ARC will conduct their annual field day at the club rooms in York Street, Teralba, in the Hunter Region. Also on this Sunday (15th) Summerland ARC will be holding a general meeting to appoint Trustees. In November Summerland ARC will be conducting a Standard course over three weekends.

Some regions currently do not have active assessment teams. Two of the four undertaking the July Foundation course at ARNSW were from the Hunter Region. Would clubs and groups with active courses and assessments please advise VK2WI News by an email to *office@arnsw.org.au* so that we can answer inquiries that come into the office. There were six candidates doing various licence assessments at ARNSW in July.

The ARNSW library now has a good stock of amateur radio magazines from recent donations and no more are required. Thank you. We also welcome donations of equipment as well as handling Deceased Estates. What we are unable to handle are towers or antennas.

WICEN NSW will be providing communications to the Memory Walk and Jog in the Hunter on September 8th, The Trek for Timor in Kangaroo Valley on Saturday 21st September and the Illawarra Memory Walk on October 13th. The annual SAREX Barrington Tops aircraft search is over a weekend in late October.

73 – Tim VK2ZTM.

Silent Key

John Pile VK3APO

It is with regret that we advise the passing of John Pile VK3APO on Sunday, 30 June, 2013. John had been a member of the Geelong Amateur Radio Club since 1958 and was also a member of its sister club, the Geelong Radio and Electronic Society.

Born near Colac in Victoria's western district, John apprenticed as a motor mechanic and in May 1955, aged 18, he was called-up for national service, in spite of the fact that he had developed a mild form of polio as a child. He was placed in RAEME (Royal Australian Electrical and Mechanical Engineers) number 3/773055.

After national service he joined the CMF (Citizen Military Forces) and was deployed to Colac where his responsibility was to maintain vehicles and 25 pounder guns for a Battery of the 10th Medium Regiment, Royal Australian Artillery. He later received the Australian Defence Medal and the Anniversary of National Service Medal.

John married Eileen and the couple moved to Geelong where he took up a position with the GMH (Holden) Dealer in Geelong.

John's bad health eventually forced him to retire from the heavy work on motor vehicles. He then took up work in a security business which brought together his interests in guns, radio and cars. John acquired his VK3ZPO licence in the early 1970s.

After Ash Wednesday, and the regionalisation of WICEN under the DISPLAN umbrella, John participated in a number of training exercises, both in Geelong and the Otway Ranges. He later became WICEN Co-ordinator for this region for about five years. John was also involved in community work together with his wife Eileen, doing Meals on Wheels for many years.

During the GARC's Marconi Centenary re-enactment of 2006, John sourced much of the antique radio equipment which was on display then and which remains on display today in the reproduction Marconi Hut at the Queenscliff Maritime Museum.

When mobility restricted him to a Gofer, with the assistance of GARC members, a VHF/UHF transceiver was installed on the vehicle for his convenience. Johns' health really took a spiral during 2011 and he began to dispose of much of his collection.

Both the GARC and GRES club members will remember John as a knowledgeable, resourceful and friendly person and he will be missed.

The above was compiled by Tony VK3JGC from information kindly provided by two friends of John, Barry VK3SY and Cal VK3ZPK.

VK4news QTC

Mike Charteris VK4QS
e *mikevk4qs@gmail.com*

G'day fellow amateurs, and welcome to the 'Spring' edition of QTC. As we sail through the month of September you will read about the great many happenings and activities that you can get involved in both locally and on air. I would like to take this opportunity to thank all those clubs who have been kind enough to send me news on what they have been up to in the past few months. I would like to see all clubs in Queensland get a good airing in the pages of 'QTC' to let others know what they are up to, and how they can participate, be it on air or by way of physically showing up at an event. So pop me an email with the details, preferably with two months advance notice for everyone to get involved, based on publication of *AR*.

REDFEST

Just another reminder that next month the Redcliffe Club will be hosting their 'REDFEST', on October 5th, at St. Michael's College, 1-63 The Abbey Place, Caboolture. Tables are just $10.00, and hot food and drink will be available on the day. For any further details, go to *redfest@redcliffearadioclub.org.au*

Photo 1: Photo 1: Gladstone ARC and RADAR club members assembled at the Amy Peak (146.900 MHz) repeater site for a major maintenance upgrade.

Photo 2: Chris VK4TCI, Rob VK4VST and Paul VK4HN preparing the 3 x 600 watt panels for installation on the repeater hut roof.

If we support our local clubs then I am sure it can only make the future brighter for all amateur radio operators.

SOTA in Queensland

This month we hear from Dave VK4OZY, who's kicking off the SOTA Summits of the Air here in Queensland. If you've ever contemplated operating a portable station after a scenic hike in the great outdoors, then maybe the SOTA (Summits On The Air) awards program is for you. There are many hundreds of summits along the eastern side of VK4 where the majority of amateurs live and play. Imagine operating your QRP station from the heights of Mount Cook in Cooktown, North Queensland, at 431 metres, let alone Mt Whitfield, 364 metres in Cairns. Other challenging peaks include Castle Hill, 286 metres in Townsville, followed by Mt Blackwood, 590 metres in Mackay, Mt Archer, 608 metres in Rockhampton, or even Mt Mee at 551 metres. There are many other worthy summits within the scenic rim of south east Queensland, without even mentioning some of the more exotic peaks that can be found on the Whitsunday group of islands. Dave VK4OZY is very keen to undertake getting SOTA off the ground if you'll pardon the pun. He has thus far completed the mapping of three out of the fifteen regions in the south east of Queensland. In addition to this Dave is currently mapping the summits of most of the coastal strip before submitting the documentation for approval. If any other keen amateurs would like to assist Dave with setting up documentation for SOTA, or even an awards program, be it as a chaser or activator then please contact him by email at *vk4ozy@gmail.com*

So, here's a great opportunity to get in on the ground floor and set up SOTA for our state of Queensland, and one that would surely be very rewarding as both an activity and special interest.

Caboolture Ham Fest

This month we hear from Peter Hewitson VK4QC regarding the recent, inaugural, Ham Fest at the Caboolture Radio Club (CRC).

'Leading up to the event the week had threatened rain, but come Saturday the heavens displayed blue sky and glorious sunshine. The Caboolture Scout Group had kindly given us access to their two large sheds, where the BBQ, tables and chairs were set on Friday in preparation. One of the sheds catered solely for the tea, coffee, cakes, tables and chairs for the relaxation of the patrons. Saturday morning arrived and Sellers started filing in to set up their tables around 7.00 am in shed two. By 8.00 am the cars started arriving, and an hour later the gates were opened for the show to begin.'

'Every entrant received a free raffle ticket for their chance at winning the Lucky Door prize, a dual band handheld. This was kindly donated by none other than Dave Tavener, from VK4ICE Communications *vk4ice@vk4ice.com* The club also sponsored a few extra consolation prizes as well. The day was going so good that we wondered if there would be enough space in the car park for everyone that was turning up. The SEQATV group created a lot of interest with the four digital TV links set up on different bands as well as a link to an ATV repeater on 446.500 MHz. The group also kindly donated a digital set top box to the club, so we will soon have our own digital ATV setup.'

'In the seller's shed there was all and sundry for sale from amplifiers, transceivers, test gear and antennas plus many a bargain to be had. The WIA were warmly represented by Ewan and Margaret McLeod selling shirts, caps, badges and training manuals, plus membership to our national body. It didn't take long for Ray VK4FTEN to sell off 1500 metres of LMR400 coax in various lengths to those in need as the queue grew longer by the minute. Those attending on the day availed themselves of a tour through the club's operating rooms, two metre repeater rack, workshop, and amenities room. They also enjoyed the outdoor deck, now covered with a new roof thanks to the Moreton Bay Regional Council. As the day drew to a close we estimated that there had been about 120 people visit on the day, with most if not all commenting most favourably about the event. In light of our first successful Ham Fest, the club is looking forward to planning next year's event to be bigger and brighter. The CRC would like to take this opportunity to sincerely thank everyone who attended, and helped make the day a truly great event. The CRC would also like to send a very special thank you to Dave Tavener for his generosity in donating the lucky door prize at our Ham Fest. Cheers for now, Peter Hewitson VK4QC.

Central Highlands Amateur Radio Club - AGM and 25th year celebrations

The month of September 2013 sees the Central Highlands Amateur Radio Club celebrate the 25th anniversary of its formation. The club plans to honour this milestone at the famous Central Highlands AGM Weekend. This will see a range of activities being organized from Friday September 27th at 4.00 pm through to 12 pm Sunday 29th September, 2013. The invitation goes out to all past, present and future members and their families to attend the celebrations. The weekend will take place at Camp Fairbairn near Emerald, and will include activities such as sausage sizzle lunch, BBQ dinner, drinks, happy hour, AGM, monster multi draw, money board and the famous monster auction. So don't wait till the last minute as you may miss out on overnight accommodation. The latest date for RSVP is Friday September 13th; lucky for some. You can RSVP via email, being *vk4wch@wia.org.au* or contact Helen Wood, the club secretary. We look forward to seeing you all for a weekend to remember up in the Central Highlands.

Gympie Communications and Electronics Group (GCEC)

The GCEC recently held their AGM, which saw Bob Dixon VK4MR elected to the position of President. Former President Ed Fisher VK4ABX stays on as Vice President, while Roger Stierli VK4BNQ becomes Head Scribe, and Paul Medway VK4YPM holds the purse strings as Treasurer. This team will surely carry on the good work of the last committee and see the club move forward progressively even further. Of recent times the club members have been most fortunate to move into what is now their clubhouse. This was formally a building of the Gympie Railway Station, being at the northern end of the platform. It's here that they meet every second Thursday of the month at 7.30 pm, as well as participating in the Rattle Twilight Markets. The club room is often open on a Wednesday morning from 10.00 am to midday for social meetings and building maintenance sessions. If you're in the area, pop in for a cuppa as all are welcome. The club is currently looking at establishing a radio mast with a range of antennas to cover HF and beyond. If you live in the area and would like to pop by to check the club out, then possibly the best place to start is the club website at *www.gceginc.org.au* and check out the site.

Well that's about it for this month folks, just remember if you would like to have your club highlighted in the pages of *AR*, by way of the pages of 'QTC', then just drop me an email and send along your news. Even if it's just a brief on club events and activities, just let me know and I will write it up for you. Good photos of club activities are also welcomed, but it is requested that they are high resolution. All the best for now.

D-STAR QSO Party 2013

Icom is pleased to announce that the **2013 D-STAR QSO Party** will be held from 0:00 (UTC) on the 20th of September until 24:00 (UTC) on the 22nd of September.

Like previous years, the goal of the event will be to contact amateur radio operators in as many different countries as possible.

More information, including rules and log reporting conditions, can be found on the D-STAR Party website ***http://www.icom.co.jp/world/d-starparty2013/***

Prize details will be available at the end of August.

Spotlight on SWLing

Robin Harwood VK7RH
e vk7rh@wia.org.au

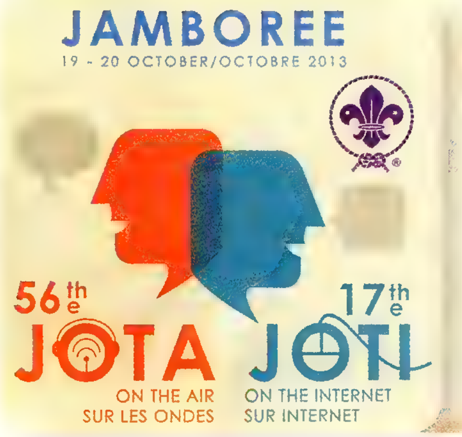
Spring may have arrived earlier than normal at my location. There is a pair of wattlebirds nesting just outside my kitchen window. They are only native to this state and very noisy. They are one of the larger members of the honeyeater species and there seems to be an active colony of them around this retirement village.

Another hobby publication will be closing in December: 'Monitoring Times' started as an offshoot of Grove Enterprises, a well-known electronic hobby shop in the US and has been around for 30 or so years. Bob Groves decided to retire and also close both 'MT' and his successful firm. Many stateside amateurs and shortwave enthusiasts are saddened by this, judging by postings on Internet DX forums. Yet it has been the Internet which has contributed to the slow decline in hard copy shortwave magazines such as 'MT'. Loggings and questions are now posted instantly and making magazines and bulletins redundant. One wonders if this magazine can survive in print format. I hope that it does but time waits for nobody these days.

Radio Australia has instituted changes as from the 21st of July. The English, Asian and Pacific streams were combined into one with the Indonesian and Chinese languages being axed. Transmissions to the former target areas are unaffected for now, being replaced by English. The programs for Melanesia in Tok Pigin continue. This seems to be an artificial language made up from the various dialects and English. However it seems that RA may not be on shortwave for much longer. I believe that the BBC World Service aims to be completely off shortwave by 2015.

I have often remarked that the Chinese have emerged as the dominant shortwave broadcaster. It is so easy to find programming from Beijing as they have numerous senders within the PRC as well as relaying from Albania, Cuba and Spain. They did erect some small senders in Mali but these have not been observed of late and not maintained. Mali is still recovering from a civil war earlier in the year with troops from France coming to their assistance against Islamist rebels.

Iran also has dramatically increased their shortwave presence. It has become quite common to hear Teheran in a variety of languages and dialects. Iran is three and a half hours ahead of UTC and programming commences on the local hour but recently they altered programming times to start on the UTC hour. However Australasia is not on their target list and neither is the UK. They do have an Arabic service which is almost continuous. The Iranians mainly follow the Shi'a strand of Islam whilst the majority of Arabic speaking countries are Sunni. There are frequent clashes between the two, particularly in Iraq and Pakistan with numerous casualties.



Plan NOW for JOTA/JOTI 2013!

Contact your local Scout or Guide group.

The **56th Jamboree On The Air** will take place on 19 and 20 October 2013.

This year's theme is: **Let's Share!**

SOTA

Bernard Petherbridge VK3AMB

The SOTA Chaser

The recent articles have focused on the role of the Activator. This article is all about the Chaser.

According to the SOTAdata website there are now in excess of 3000 Chasers globally, of whom 1900 are also Activators. The math says therefore that there are over 1200 'pure' Chasers out there who may be remotely located, mobility restricted, do not have suitable equipment or are simply not interested in activating summits. In total, over 1.2 million Chaser contacts have been logged to date in 707 SOTA Regions from over 15,000 Summits.

All of these numbers mean that Chasers have plenty of opportunity to get engaged in SOTA activities.

Photo 1: The VK3AMB Shack Sloth trophy.

In Australia, activations have typically occurred on the weekends. In early 2012 it was not uncommon for there to have been no, or insufficient, Chasers responding to an Activator's CQ, but how times have changed! *(Editor's note: You are not wrong Bernard! I recently activated VK3/VT-006 Mount Saint Phillack. I had qualified the summit in less than two minutes (the minimum four contacts) and had made 17 contacts in 10 minutes – fast and furious!)* Whilst there are certainly more summits being activated of late, most noticeable are the new Activators and the considerable number of new Chasers. Each week new callsigns are heard from both sides of the QSO.

Chaser Tools

The availability of supplementary resources to support activations has definitely helped the Chaser. Instead of scanning 40 m all weekend in the hope of stumbling upon an activation, we now have far more visibility of upcoming events.

The Australian Yahoo group *http://au.groups.yahoo.com/group/SOTA_Australia* is a fantastic resource for becoming aware of Activators future plans (sometimes months ahead), as questions will be asked about site access, local conditions, locked gates etc. Then, approaching each weekend, Activators will often detail their plans and time expectations. For some recent mid-week Activations providing this 'heads-up' to the Chasers helped considerably in qualifying the summits.

A quick look at the Alerts on SOTAwatch *http://www.sotawatch.org/* on a Friday evening and you will know exactly when you need to be out of bed and sitting

Photo 2: Bernard VK3AMB at the radios at home.

Photo 3: Ian VK1DI (right) receiving a VK1 Shack Sloth Award from Andrew VK1NAM at a recent CCARC meeting.

by your radio. The home page refreshes automatically so it is easy to keep monitoring what is coming up and when. As the page also displays Spots for activations that are currently in progress, you can quickly verify details such as operating frequency, operator name and summit reference number.

Extending access to this resource is the use of mobile technology applications. There are applications available for iPad/iPhone (e.g. SOTAgoat) and Android devices (e.g. Pocket SOTA) that allow you take the information with you when mobile and reduce the need to tether yourself to the radio for extended periods. Taking this a step further, you can also utilize 'push-alerts' on these devices.

It is not uncommon for Activators to take more time to reach a Summit due to road conditions, locked gates, scrub density and simply the distances to be covered, so the provision of 'push-alerts' to mobile devices is very handy indeed. You can be in the back yard working on other projects, have the SOTAgoat alert 'bleat', race inside to pick up the contact then return to the outside project. Tip: Just remember to turn off the sound on these apps when you go into business meetings or you will definitely attract the attention of the room.

In Australia the vast majority of contacts to date have been 40 m centred around 7.090 MHz and on some weekends frequencies around this point can be very congested with QRP operations as well as nets. Alerts and Spots help the Chaser to track down the exact activation frequency.

Supporting the Activators

The QSO process itself has been covered in a previous article and as the number of Chasers has increased measurably the pile up that the Activator must deal with has also increased. Whilst it is fine to jump in 'boots-n-all', the resulting pile-up can make it difficult for the Activator, especially when they are new to SOTA. Chasers can help considerably by being prepared with the summit details at least. Experienced Activators will increasingly deal with a pile-up by filtering their CQ to ask for summit-to-summit, mobile, portable, then state by state responses. This does work well and provides efficient management of the QSOs.

Chasers can also help the Activator to make their minimum number of contacts by offering to drum up contacts via repeaters, asking on nets and joining other QSOs in progress on the same or other bands. This is unlikely to be the situation on 40 m any weekend, but might apply on a 2 m only activation or activations at odd times of the day. Assisting in the successful completion of an activation might also include asking the operators to repeatedly 'try again' when experiencing difficult conditions until the contact can be completed (Remember however that the signal report between the parties needs to be unassisted in order for it to be a valid contact under the SOTA rules).

This latter point is also why signal report information should be avoided when submitting a Spot on SOTAwatch (something less specific such as 'Strong signal into…' is absolutely fine).

Also remember to listen to the instructions from the Activator – it can be very tiring dealing with the pileups when out on a summit. It is very different to sitting comfortably in the warm shack! The Activator will usually try to work everyone calling, unless there is some pressing reason to cease operations.

Challenge yourself

As a Chaser, it is easy to use substantial power levels when making contacts. A post on the Yahoo Group challenged Chasers to operate QRP, just like the Activators and many have taken up the challenge and rediscovered just what can be achieved with only a few watts. The SOTA 12 m Challenge has prompted others to use this band for the first time with good success. Rounding things off, there have also been a few more CW activations in recent months for those with that capability.

It is clear that Chasing SOTA is so much easier today than what it would have been 10+ years ago in SOTA's early days and with the level of activity in VK increasing considerably, it is a very good time to get into SOTA as a Chaser and work towards joining the 11 Shack Sloths in VK at the time of writing.

SOTA News

Allen Harvie VK3HRA

With the winter weather coming there were gatherings of SOTA participants held in VK1 and VK3. These were held during the week keeping the weekend free for activations. In Victoria, chasers and activators met for evening meal and open conversation. There was a show and tell feel to the VK3 evening with maps and bivvy bags being shown as well as plans being made drawing on the experience available on the night. It's a credit to the amateur community that knowledge is shared with such enthusiasm.

The harsher winter weather has not slowed activations. There were several activators taking advantage of school holidays to activate alpine summits. Being winter, there was several activations completed during harsh conditions with many a soaked activator enjoying the Aussie bush. There have been no reports of injury reflecting the level of planning going into these activities. Road closures and controlled zones are slowing down the more extreme activations. Maps and blogs are being reviewed with a concentrated effort being made to exploit the summits within safe access. It is already evident that as experience builds and activators share reports activations can be maintained during all conditions.

Congratulations go out to VK's newest sloth – Matt VK1MA.

The current activity brings more into the SOTA fold with new activators for the month including: David VK3IL, Peter VK3FABY, Phil VK3BHR, Keith VK5OQ, Colin VK3LED, Ray VK3YAR and Mike VK3XL.

100 activator points achieved by David VK3FMDV, Rik VK3KAN, Ian VK1DI, Andrew VK1NAM and Brian VK3MCD.

100 Chaser points by David VK3FMDV, Ian VK3IFM, Andrew VK1MBE and Dean VK3XY.

73 for now.

Some of the VK3 SOTA group members at the recent social gathering.

VK6news

Keith Bainbridge VK6RK
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News has been very thin on the ground this month. I've spent most of July in G land after the death of my father and on return with just two days to the deadline I only have reports from the NCRG and HARG to pass on to you all. So here they are.

News from HARG - The Hills Amateur Radio Group

At our mid-July meeting ten members of HARG with some XYLs and children were treated to a fascinating tour of the Water Police Coordination Centre and Coast Radio Operations Centre at North Fremantle, thanks to John Farnell VK6JGF who previously worked there as a radio operator. A number of us met at Cicerellos in Fremantle for a pleasant fish and chip lunch prior to the tour. The Water Police Coordination Centre and Coast Radio Operations is manned by a hard working group of civilian radio operators who have responsibility for maritime safety over the whole 13,000 km of the WA coastline. This is achieved by the use of remote controlled transceivers located further up the coast in Port Hedland and other locations and inland at a high location at Canning Mills. The radio operators are civilians but must have a current Marine Radio Operators Certificate and extensive maritime search and rescue knowledge. Some, like John, are also amateur radio operators but even an Advanced amateur licence on its own is not sufficient for this highly skilled job.

The most fascinating part of the tour was the demonstration of the 'SARMAP' Maritime Location System. This is a very sophisticated tracking and position prediction system. Once the coordinates of a person overboard or sinking vessel are known these are entered into the system which has real time access to winds and currents in that area. The system displays mapping data on a large screen of the area in which the person and/or boat is likely to be found at any time in the future. The practice scenario entered by the operator for us showed a man overboard and his now unmanned drifting boat. You could see clearly how the boat was moving away from the accident site more quickly than the sailor as the boat was subject to wind pressure and currents while the sailor was only subject to currents due to his much lower profile to the wind.

The radio operator's position has access to many different local and remote transceivers to enable VHF maritime frequencies and marine distress HF frequencies to be monitored. There are also dedicated radios and telephone systems to contact police, harbour authorities and other maritime agencies. The radio operator's chair never gets cold as the position is manned 24 hours of every day by a rotating team.

The North Fremantle centre houses a number of very fast boats including the ocean going 'Cygnet V' plus a fully equipped dive team. Part of the diving equipment is a completely sealed and self-contained dive suit which enables the diver to search such nasty places as a sewerage farm. The diver is completely isolated from all the 'nasties' in the water but the colleague who has to hose him down later is not so lucky.

Thanks to John for a thoroughly enjoyable and educational tour. Cheers and 73 from Bill VK6WJ for HARG.

Thanks for that Bill, who I might add was also in the UK at the same time as I was and still managed to get a report in!

Come on you other groups, please let me have some input!

Hamfest is three days away as I write this so there will be a full report in the next VK6news.

Contest season is approaching and the Northern Corridor Radio Group (NCRG) is rebuilding the operating positions in both shacks to make the contesting easier and more isolated from each other. There is extensive work planned on the antenna systems as well, all to improve the competitiveness of the stations, with towers being moved around, antennas relocated to different heights to reduce band interference and a big overhaul of the computer logging and filtering control.

So, if you are contest orientated or just want to have the excellent facilities available to use, come along and meet the members on a Sunday morning or at one of the two monthly meetings and join the club.

The club facilities are also available to interstate or overseas amateurs visiting Perth and every effort will be made to give you the chance to 'work the folks back home' or do some serious DXing while visiting WA. There are already a couple of overseas amateurs who are planning to operate from Neil Penfold State Amateur Radio Centre next year in some serious CW contests, why not come along?

Well that's it from me on this much reduced report this month. Hopefully there will be more next time. 73.

VK7news

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w *groups.yahoo.com/group/vk7regionalnews/*

John Rogers VK7JK – 90 years young!

WIA Life Member John Rogers VK7JK turned 90 in July 2013. John can be seen in the photo at his 90th birthday celebration, still keen to demonstrate his receiver technique!

John grew up in Britain and was one of the many who went off to WWII and flew Mosquito Photographic Reconnaissance missions in and around Singapore for the RAF. Post war (1947-49) John undertook teacher training and dedicated his life to teaching. In 1958 he became head teacher at an ESN school in Manchester and in 1970 became a school inspector. In 1979 John retired and decided to move to VK7 and settled in Blackmans Bay for 33 years, until his move to Strathaven in June 2012.

John says he had five reasons for coming to Tassie: *'1. The weather's better. 2. We spoke English. 3. We drive on the correct side of the road. 4. It was half the pace of life back in the UK, and 5. The sun came out enough to charge his watch battery!'*

John's interest in radio started with him becoming a teacher but it wasn't until he arrived in VK7 that he got his amateur radio licence. In 1980 he became involved in the VK7 broadcasts and in the words of Richard VK7RO: *'John was one of the best things to happen to amateur radio in Hobart because he was really good at getting things going.'* He used to stand up in the meeting and raise enthusiasm by saying things like… *'it's like manure - no good unless it's spread around.'*

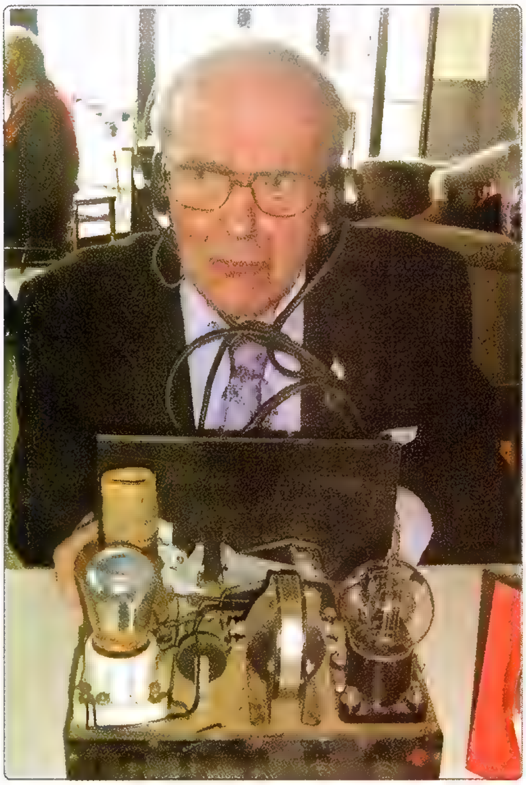

Photo 1: John Rogers VK7JK.

John resurrected the WIA Tasmania Divisional newsletter, called QRM, in 1984, becoming the editor and these are still available in the State Reference Library. In 1985 he helped to start the Activity Group with an emphasis on QRP and construction and by 1987 John was broadcast coordinator and was involved with the VK7 broadcasts for 28 years. John also helped start amateur radio classes with Richard VK7RO.

John has suffered several family tragedies over the past years, as well as his poor health, but still comes up bright and shining. As Charles VK7PP says *'It is a privilege to know one of "the RAF few", and of course we all love him.'*

Congratulations on reaching 90 years young and for your many years of dedication to this great hobby. Thanks to all contributors and Richard VK7RO for the great photo. Compiled by Justin Giles-Clark VK7TW.

Many amateurs will be using or know of Australian made Moonraker antennas. This company was established in 1971 by amateur Len Edwards at his home workshop in Geilston Bay, a suburb of Hobart. His business grew and many amateurs will remember Len moving to a former service station in Lindisfarne village. Moonraker was successful with automatically tuned HF antenna systems. Son Chris joined the business and it moved out to its current location at Technopark at Dowsing's Point. Today the company specializes in the lower end of the radio spectrum from 10 kHz to 1500 MHz, designing and manufacturing a wide range of antenna systems. On June 28th this year Chris and Geraldine Edwards retired from the company and Barrett Communications Pty Ltd acquired the business. Radio amateurs would like to thank Chris and Moonraker for their generous assistance over what has been an amazing period of design and manufacturing in Tasmania.

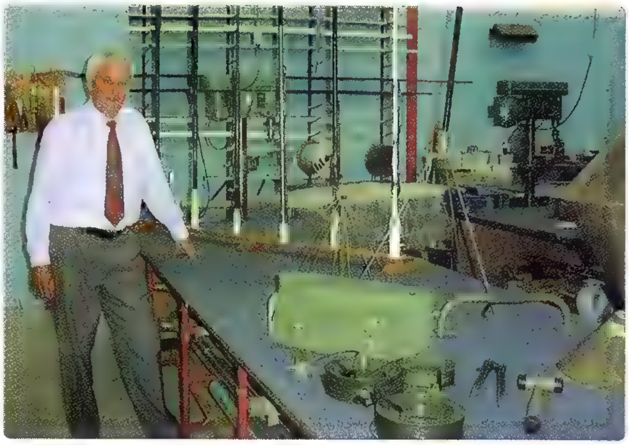

Photo 2: Chris Edwards at the Moonraker manufacturing facility back in 2004. Photo courtesy of VK7TW.

Thanks to Alan VK7ZAR for the above information.

Repeater News

Hayden VK7HA has let us know that a new 70 cm repeater VK7RML on 439.950 MHz Tx and 434.950 MHz Rx with a CTCSS tone of 91.5 Hz is in operation. VK7RML will be permanently linked to VK7RCH (Grey Mountain – Southern VK7) and VK7RAA (Mt Barrow – Northern VK7). Location is at Mt Lloyd near New Norfolk and will also have an APRS digipeater at the repeater site. For more information take a look at Hayden's website at *http://vk7rch.blogspot.com.au/*

Cradle Coast Amateur Radio Club

CCARC's June meeting saw David VK7DC give a presentation on the SDR SHARP software utilising a USB TV tuner dongle. This is an amazing device that for around $20 plugs into a computer and can decode AM, FM, wideband FM, SSB, CW and digital signals from 24 MHz up to a 2 GHz range. Thanks David.

Northern Tasmania Amateur Radio Club

I have been told the new NTARC clubrooms are coming along nicely with much building, painting and many working bees planned. The training room is taking shape and even a new wood heater has been sourced thanks to Ian VK7IH. It is great to see so many involved with the new clubrooms. Congratulations to Alan VK7BO who was a member of the winning Australian team in the 2013 Radio Society of Great Britain Commonwealth Contest.

The July NTARC meeting was a fascinating presentation by Dr Frank Madill a local GP who has written a book called 'Out of the Darkness,' the story of Max Sanders DFC and his time in World War 2 Bomber Command. Max flew as the navigator on Lancaster bombers for 31 missions and survived to tell the tale. Frank has captured Max's story is an absorbing book covering the period. Many thanks to Frank and I understand all the copies of the book were sold on the night.

Photo 3: Jim Parish showing the cross polarised antennas used on the Community Radio transmitter. Photo courtesy of VK7TW.

Radio and Electronics Association of Southern Tasmania

We welcome Lance VK7LDC, Jim VK7FOTR and Glen VK7FADC to the air waves. All recently passed their licence assessments. REAST's July presentation was given by Jim Parish and he covered community radio and the technology behind it. Jim is the Technical Manager of Community Radio Stations – Hobart FM and Radio 7RPH. Jim took the audience from the start of the chain through to the RF transmission and the technologies utilised including the digital codecs used to supply the transmitter sites around Tasmania for 7RPH. Jim then took us on a tour of the 7RPH studios to see first-hand this technology. A huge thank you to Jim for coming along and giving a very informative talk.

Our DATV nights have been a hive of activity with a focus on homebrewed 630 metres with a 100 W class D MOSFET amplifier, a TAPR.org TADD-1 GPSDO distribution kit, the PA0RDT miniwhip antenna, audio MOSFET amplifiers, antenna tuning units, broadband transformers, PICAxes and RaspberryPis. Our videos have included SERG convention ARDF, Gippstech 2013, historic NASA videos, the German Friedrichshafen hamfest 2013, Randy K7AGE videos and Bob Heil's Ham Nation episodes. We have a lot of fun!

VHF/UHF - An Expanding World

David Smith VK3HZ
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Weak Signal

In late July, good propagation resulted from a high-pressure area moving slowly across the south-east of the country. Colin VK5DK submitted a timely report on some of the activity that occurred:

With the winter upon us, there is not much incentive to operate on the VHF bands, but there are regular contacts to be made for the amateurs who are prepared to run regular skeds, mainly of a morning.

Robin VK5TN started running regular skeds at 2230 UTC with Gordon VK3EJ in Cobram on the Murray River, 480 km from Mt Gambier and was surprised at how good signals were on a regular basis. It would appear that there is a flight path which helps to enhance signals over this distance, although we are not sure whether it is a Sydney to Melbourne flight or a Melbourne to Adelaide flight, but the signals usually peak to a S9 for a short period. I have also joined in of recent times along with Owen VK5HOS and occasionally John VK5DJ joins in as well.

On Wednesday morning 24th July 2013 (23rd UTC), as predicted by the Hepburn Propagation Charts, there was a good 144 MHz band opening between stations from Gawler (VK5BC) to stations in the Launceston area (VK7XX and VK7AC), a distance of over 1000 km. Signals from both VK5BC, VK7XX and VK7AC were 5 x 9 here in Mt Gambier. During the opening VK3EJ, VK3AXH, VK5BC (144 MHz and 432 MHz), VK5AKK, VK5ZK, VK7XX and VK7AC were worked in Mt Gambier with all signals at 5 x 9. Later in the afternoon, Leigh VK2KRR was worked from this QTH on 144 MHz, 432 MHz and 1296 MHz, a distance of around 650 km.

The following morning Thursday 25th July (24th UTC), conditions were still very good. On the regular 2230 UTC sked with Gordon VK3EJ, signals into Mt Gambier were 5 x 9+ for the entire duration of the contacts with Robin VK5TN and I on 144.1 MHz, followed by excellent signals from Ian VK3AXH in Ballarat and Rob VK3XQ in Yea. Following these contacts, Mark VK2EMA called in from Tottenham in western NSW and had contacts with both Robin VK5TN and I on 144.1 MHz and I was able to also work Mark on 432.1 MHz although signals were dropping by the time we completed. The distance to VK2EMA from Mt Gambier is 860 km which is an excellent contact in the cold winter conditions.

Conditions are now back to the normal winter signals although regular contacts with Gordon VK3EJ are still being made at 2230 UTC each morning, including weekends.

VK5RSE 144.550, 432.550 and 1296.550 beacons

Colin VK5DK and John VK5DJ submitted the following report on the status of the Mt Gambier beacons:

After many years of reliable operations, the three VK5RSE beacons are being retired. They have been used by many operators as a guide to propagation to the south east of South Australia and as an indicator of home station performance for others.

The old VK5RSE 144.550 beacon was reliable but its frequency did wander as a result of changing temperature inside the poorly ventilated concrete communications tank. On reaching 30°C it was programmed to send dits to reduce the TX cycle and minimise further heating. Dits were a frequent occurrence in summer.

The 432.550 MHz and 1296.550 MHz beacons were added later to complement the existing 144.550 MHz beacon. Russell VK3ZQB was instrumental in building these some 10 years ago and although offering better stability still relied on a crystal without an oven.

Following discussions at a South East Radio Group meeting, it was agreed to upgrade the beacons and GPS lock each. This move now enables operators to accurately calibrate their receivers on these three bands and equally importantly know where to listen when monitoring the beacon frequency.

Discussions were held with Graham VK3XDK as to whether PLLs capable of GPS locking were available for the required frequencies. Graham advised there were and that David VK3HZ would be able to write the software for the beacons to CW identify once per minute. It was possible to run the three beacons using just two boards with one being shared by 144.550 MHz (RF1) and 1296.550 MHz (RF2). Two PLL units were purchased from Graham and programmed by David with the correct data written into the PICAXE chips on the PLL PCBs. The identification for each beacon includes callsign (VK5RSE) and grid locator (QF02). For reference the beacon location is 140.4467E, 37.5249S or locator QF02fl, just north of the small town of Mt Burr.

Both PLL boards were fitted into a shielded box to provide outputs *for the three beacon frequencies. The 10 MHz input to the boards is provided by a Trimble Thunderbolt GPS. PLL outputs are around 8 to 10 dBm and are fed to separate amplifiers to increase output on all frequencies to just over 20 W.*

On 144 MHz, a PA stage from a Philips FM828 was used to increase the output from the PLL board to around 22 W. This unit was chosen for its availability and it reliability in commercial service.

After some discussions it was decided to purchase a Mitsubishi RA30H4047M1 RF Module from Mini Kits in Adelaide for the 432 MHz amplifier. It was felt that this was the simplest way to obtain the required 25 W output required. When this module was installed, there wasn't enough RF drive to deliver 25 W so a low power module (CA4800C) was added and easily provided the necessary drive for the Mitsubishi amplifier. The CA4800C normally produces 400 mW from 10 MHz to 1000 MHz when used with a 28 V supply but when supplied with a 13.8 V supply produced around 80 mW which easily drove the final amplifier to 25 W. A low pass filter has been added to the output as specifications stated that without a filter the 2nd harmonic was only 25 dB down. The LPF ensures the 2nd harmonic is now greater than 45 dB down on the fundamental signal.

The 1296 MHz unit used is the existing PA from Alan VK3XPD and has been in service for some years. It was not known if there would be enough RF drive from the PLL unit (9 mW) to obtain the required 25 W output, but when tested produced just slightly more than 25 W on the Bird Thruline Wattmeter.

The 144 MHz/432 MHz beacons and the PLL units are mounted on a large heatsink obtained from a Larcan CH1 TV PA unit. A 12 V muffin fan running on six volts is supplying cooling for both these PA units while the 1296 MHz unit is a separate unit with a cooling fan enclosed on the chassis.

Following tests at the beacon site it was discovered that the original switch mode supply powering the 1296 MHz Beacon would work only if switched on without load. A replacement power supply has been pressed into service and all tests so far indicate it will operate well with plenty of reserve capacity.

One of our main aims when the beacons were upgraded was to enable them to be remotely switched on or off. Chris VK5MC at Hatherleigh lives only 16 km from the site on Mt Graham. Chris is a 1296 MHz EME operator and on moon rise his 10 metre dish is often pointed directly at the beacon site resulting in significant receiver overload. John VK5DJ has developed a remote control unit making use of a receiver scrounged from a WeathAlert unit and a modified VK5DJ repeater controller board using a PIC16F1827 and a MC145436 tone decoder to provide password and codes to switch any combination of the beacons. While using EME or terrestrial modes Chris will now be able to switch off a beacon if necessary.

SERG hopes that our VHF/UHF neighbours will find the new beacons even more useful than in the past. Reception reports are always appreciated and should be sent to Colin VK5DK at vk5dk@bigpond.com *With the 10 GHz beacon soon to be installed at Mt Graham this will complete the beacon set in the SE of SA and provide propagation indicators and test signals on a range of frequencies.*

47 GHz – finally digital!

Dan VK2GG send in this report of his latest exploits on 47 GHz:

After many months of planning and testing, I finally got my FT-817 with XRef, my 47 GHz Kuhne transverter with Kuhne PA and a half decent path to play with digital.

The Rubidiums now have LED lock indicator lights and multi-outlets, and Les VK2APE and I have been experimenting with various digital modes on both FM and USB.

The path was one I have been interested in for years – Heaton's Lookout in the Watagan State Forest to Gan Gan at Nelson Bay, north east of Newcastle, 70 odd km.

Weather was looking good, after several days of fine and sunny skies with light westerly (dry) winds; temperature on the day was 15 – 17 degrees, 55% RH with a dewpoint of 2.9.

FM voice 5 x 9, and spot-on frequency! Decoding of Olivia 8-500 was no problem; we also successfully tried BPSK31.

Thumbs up to David VK3HZ and VK3XDK for the XRef, and thumbs up to the Kuhne PA/Preamp.

Also thanks to Peter VK2YGM and Les VK2APE/LP for their assistance.

VK4 gone MAD

On Sunday July 28th the Queensland group of microwave enthusiasts held another Microwave Activity Day which, despite some doubt about the weather, had a good turnout. Rex VK7MO, over on the mainland for GippsTech and other microwave missions, was a 'guest participant' giving people the opportunity to work a state-of-the-art portable microwave station on 10 GHz and 24 GHz.

Doug VK4OE was one of the microwave stations involved. Last month's column covered his trials and tribulations with the Winter VHF/UHF Field Day, and the MAD effort followed similar lines:

My report from the MAD is successes and failures tantalisingly mixed together!

Some readers may recall my description of an intention back in the Winter VHF-UHF FD to go to an excellent microwave site in the Border Ranges NP, only to be confronted by a 'Road Closed' gate - most frustrating! Well, it has happened again with the next best microwave site, Springbrook, near the carpark for the 'Best of All Lookout.'

The locked gate/bar visible in the picture has only recently been installed preventing vehicle access to the clear north-looking place just beyond the trees. This forced my use of the 'normal' carpark which, as you'll see has many trees and shrubs around it.

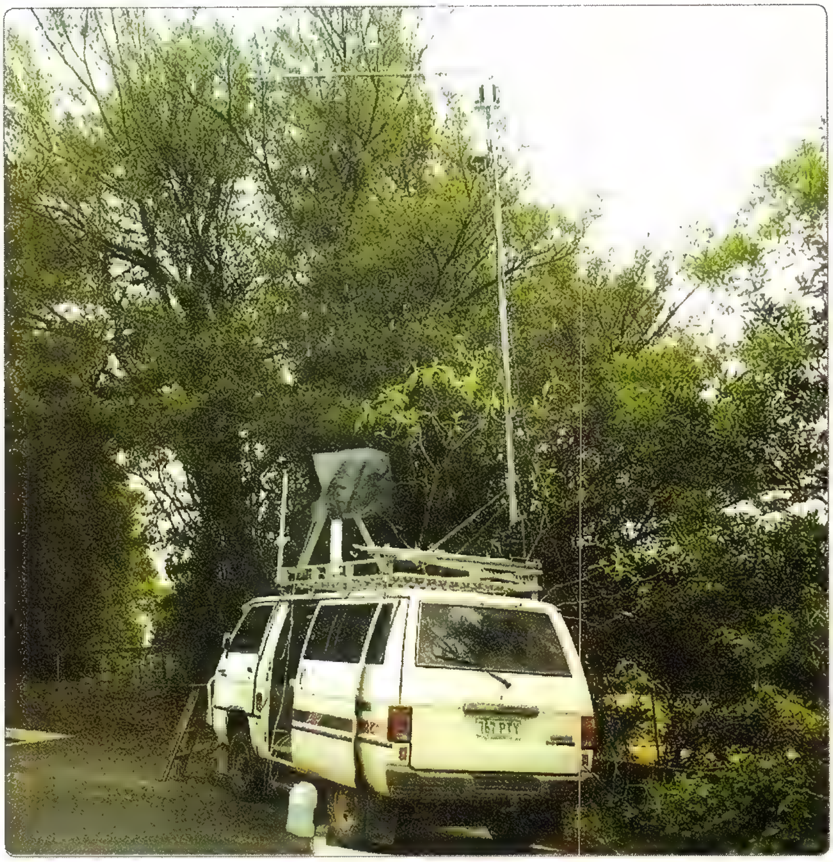
I parked strategically in order to take advantage as much as possible of a small gap in the foliage, but it meant abandoning the roof-mounted 2.4 GHz array and associated M/H box. The mast with 1296, 5760 and 10368 MHz antennas was looking over some of the immediate vegetation, but the 24 GHz antenna (on tripod under the plastic rain cover) was mostly blocked.

I recorded eight QSOs on 1296 MHz, three on 5760 MHz, six on 10368 MHz including best DX (232 km) to VK4JMC/P located at Mt Wolvi near Gympie, and two QSOs on 2403 MHz after I installed a tiny WiFi antenna on the branch of a shrub just outside the van window - connected only to the one W driver transverter.

On 3.4 GHz I had overlooked the loading of the necessary FT-817 IF transceiver (that's a different long-ish story!) and a failure of a recent modification of my 24 GHz equipment combined with the blocking foliage to 'put paid' to any thought of QSOs on that band.

It rained heavily as I was driving towards Springbrook and after I departed, but in all the time I was operating there was only one light shower of drizzle, which is different from what others were reporting.

Another interesting observation was the inability to establish two metres FM liaison with the team (VK4WS, VK4JMC and VK7MO/4) on Mt Wolvi. After initiating things by mobile 'phone, we ended up using 1296 MHz SSB as the gain antennas at each end on this band made up for the losses over the path, whereas the Mt Wolvi crew were out of range of the RBN repeater and 146.5 MHz just didn't make it.



The VK4OE microwave set-up at Springbrook for the MAD.

I do acknowledge the need for a more organised approach to managing when folk use each band - that's the way we've done it for several earlier Microwave Activity Days, and I think it was a more thorough way of getting in touch with everyone who is 'on', compared to a 'free-for-all' approach. Nevertheless, I still had a lot of fun yesterday!

Fortunately, all may not be lost as a later update from Doug explains:

Regarding my access to the excellent sites that I have referred to, the Springbrook one may well be permanently 'lost' (sad to see after about twenty years of going there) but just yesterday I received an e-mail from the Parks Ranger for the Border Ranges NP and he explained that they are just now waiting for a few weeks of dry weather in order to be able to bring earth moving equipment in, fix the water-damaged road, and then to open it up again. I just have to be patient... but I wanted to go there in the low humidity months of this winter, didn't I?

Please send any Weak Signal reports to David VK3HZ at *vk3hz@wia.org.au*

Digital DX Modes

Rex Moncur VK7MO

Six metre meteor scatter by Darrell VK2BLS

June has been a good month for six metre MS on 50.230 between VK2BLS, VK4WTN and VK5RM, usually starting with FSK441, then ISCAT-B and JTMS modes for 1/2 hour or so before leaving for the saltmine.

My log has daily FSK441 QSOs for almost all June with Wayne VK4WTN and Phil VK5RM. The N-S path to VK4WTN seems to be more favourable and we sometimes have FSK441 contacts in the evenings.

On 27 June six metres was nicely open from about 0440 to 0540 with VK4WTN 59+ on SSB for most of the time, during which we also worked RTTY and PSK31 modes for the first time on six metres.

Wayne admits being bitten by the 'digi bug' and is also keen on HF digi modes. He is currently upgrading his tower and beam systems.

Peter VK5PJ and John VK5PO sometimes catch up with us on six metre FSK.

Two metre and 70 cm meteor scatter by Kevin VK4UH

The month of July for meteor scatter operators started the slow rise out of the winter 'doldrums.' The hourly rate of returns from random meteors remained low but 28-29th July brought the peak of the Southern Delta Aquarids (SDA) shower, one of the best for each year. The SDA is a slow rising shower appearing from mid-July to mid-August as the Earth passes through the clouds of debris remaining from the Marsden and Kracht comet. The 'radiant' of the shower, the position in the sky where the meteors appear to originate, coincides with the star constellation of Aquarius, Delta being the closest and brightest star to the radiant. Unlike random meteor returns, which peak just before dawn, shower meteors peak with the 'zenith' or highest point in the sky of the naming constellation. The Zenith Hourly Rate (ZHR), the number of visual meteors seen by an individual observer on the ground, from SDA may reach 30-60 per hour. Each meteor can be expected to provide a loud and prolonged signal return or 'burn' sometimes exceeding 30 seconds on 144 MHz.

This was reflected in the excellent MS conditions reported over the weekend activity periods on 26th and 27th July UTC. Still no returns from ZL at the VK4UH QTH unfortunately. The remainder of the activity periods were spent here in attempts to achieve a MS contact in JTMS with Arie VK3AMZ on 432.230 MHz.

As frequency increases the duration of received pings decreases in proportion to the square of frequency. On 70 cm therefore (3 x frequency on 144 MHz) the pings are only 1/9th duration on two metres. The energy scattered also decreases in proportion the cube of frequency, that is, only 1/27th the signal strength or 15dB down on two metres.

Over the two days the experiments were partially successful. Two solid pings were received and decoded here in VK4 in JTMS, which is arguably better for short duration pings than FSK441 mode. Arie VK3AMZ received a number of ultra-short pings but was only able to decode his callsign and not his reports. Although a contact was not completed, there was sufficient success to know that a QSO will be possible to achieve with more persistence in the future.

Please send any Digital DX Modes reports to Rex VK7MO at *rmoncur@bigpond.net.au*

The Magic Band – 6 m DX

John McRae VK5PO

July has been a reasonably quiet month.

On the 2nd of July, Oly VK3XDX heard the ZL3SIX beacon with fairly low signals.

Some openings on the 10th between south east VK4 and VK7, Scott VK4CZ heard 59+ signals from VK7DX and VK7AC.

VK8RR worked JA7PRV on CW with 559 reports on the 5th of July.

Six metres was lively on the 14th July, with many Trans-Tasman QSOs taking place. VK3GHZ had nice signals from ZL4LV, whilst VK7DX and VK3DUT made a few contacts with several ZL3 and ZL4 stations.

On the 16th, a few VK3 stations heard the far north Queensland beacons VK4RTL and VK4RHT.

VK3XDX worked VK4APE. VK4FP in Townsville worked JR2HCB on CW with strong signals prevalent.

Hopefully the band conditions will start to improve soon, VK2EFM had a reasonable signal from the FK8SIX/B at Noumea on the 30th of July.

Alan VK4WR and Graeme VK4FI are off into the Pacific again for another go at six metres from Niue with the callsign E6RQ. Their visit is planned around the southern hemisphere E season, arriving on the island on the 7th December for ten days.

Equipment will be an IC-7000 and IC-706MK2 plus a solid state amplifier. The antenna is four elements on a 3.5 metre boom which will be up about eight metres.

Operating from Niue in April 2013 produced good contacts into Japan, China, Philippines, Hawaii and Australia. Only one contact into central America was made, which was disappointing as they'd expected more in that direction. This time around they'll will be looking towards South America for the long haul plus of course VK and ZL. QSL via VK4FI.

The ZL2WHO six metre beacon is back on the air, and using the original frequency of 50.024 MHz.

VK5VF is VERY low in output, it is just audible beaming direct.

Please submit reports, logs or other info you may consider useful to John VK5PO at *vk5po@wia.org.au*

DX-News & Views

Chris Chapman VK3QB and Luke Steele VK3HJ
e vk3qb@wia.org.au

July on the bands

Quiet conditions prevailed during July, but there were still highlights including activations from Guantanamo Bay, Haiti, Austral and Marquesas Islands and South Cook Island. Some nice openings to Africa included Somalia, Gabon, and Namibia. The most DX activity now seems to be late afternoon, around sunset, and includes Europe, Africa and North America. Twenty metres shows a strong, but short opening each late afternoon, 30 metres can be quite good too, with a chance of DX nearly any time of day. Seventeen metres still sees some good activity but 15, 12 and 10 metres are not doing much at this time of year. This should pick up again as we come out of winter.

There were many island activations at the end of July for the IOTA contest. Sponsored by the Radio Society of Great Britain, Islands On The Air provides continuing interest for DX chasers, especially those who have already worked most available DXCC entities. Whilst the DXCC list currently contains 340 entities, the IOTA list has around 1200 islands and island groups you can listen out for. Many islands are also DXCC entities, so the IOTA programme adds depth to the DX hunt. Visit the IOTA website for more information at *http://www.rsgbiota.org*

Also back on air is 5A1AL Abubaker, from near Tripoli, Libya. This country has not seen much activity recently with the civil war and continuing unrest, so it is good to see Abubaker giving us the chance to work Libya again. QSL via Abubaker's German call DL1AL.

Some upcoming DX operations

The following table summarises some of the DX activations that may be of interest to VK operators.

Date	Call	QSL via	Information
5 – 10 Sep	XW	M0URX, W5UE	Laos. 9M6DXX as XW8XZ and 9V1YC as XW1YC. SSB, CW.
7 – 15 Sep	V55V	DJ8VC	Namibia. DF3GY and DF2UU, for SSB Field Day and WAE SSB contest.
20 – 26 Sep	3D2GC 3D2DD	Home call	Fiji, Viti Levu (OC-016). LZ1GC as 3D2GC, and 3D2DD, 160 – 10 m on CW, SSB.
21 – 27 Sep	OJ0W	OH3WS	Market Reef (EU-053). OH3WS, 40 – 10 m, mainly CW.
22 – 29 Sep	VK9LL	LoTW	Lord Howe I (OC-004). VK2CCC, focus on 160 and 80 m.
27 Sep – 11 Oct	3D2GC/p 3D2DD/p	Home call	Rotuma (OC-060). LZ1GC as 3D2GC and 3D2DD. HF. CW, SSB.
1 – 11 Oct	CY0P	TBA	Sable I. (NA-063). VE1RGB, WA4DAN, AI5P. 160 – 10 m, CW, SSB, RTTY.
1 – 3 Oct	H7H	LoTW	Nicaragua. Spanish team of six. 160 – 6 m, CW, SSB, RTTY.
TBD Oct	K9W	LoTW	Wake I (OC-053). 160 – 6 m, CW, SSB, RTTY.
3 – 17 Oct	TO2TT	OQRS	Mayotte (AF-027). Team of seven ops, 160 – 6 m.

Special thanks to the authors of The Daily DX, 425 DX News, DX World, NG3K's Announced DX Operations, and QRZ.DX for information appearing in this month's column. Interested readers can obtain a free two week trial of The Daily DX from *www.dailydx.com/trial.htm*

XW, Laos. Steve 9M6DXX and James 9V1YC will be on air from **Laos** as XW8XZ and XW1YC respectively, on SSB and CW. QSL XW8XZ via M0URX and XW1YC via W5UE.

V55V, **Namibia.** Hardy DF3GY and Hans DF2UU will be on air from the station of Martin V51W in Omaruru for SSB Field Day and the WAE SSB Contest. They will also be on air outside the contest using V5/DF2UU and V5/DF3GY. QSL via home calls. See their website at *http://www.qrz.com/db/V55V*

3D2GC, **Fiji**. Stan LZ1GC and Rocky 3D2DD will be on air from Viti Levu, on 160 – 10 m, CW and SSB. Stan and Rocky will then travel to Rotuma I. See website: *http://3d2gc.com/*

OJ0W, **Market Reef**. Pasi OH3WS will be on 40 – 10 m, mainly CW. QSL OK via bureau or direct: Pasi Bergman, Tuulipolku 4, 13500 Finland.

VK9LL, **Lord Howe I.** Tomas VK2CCC will be focusing on 160 and 80 m, but may be on higher bands also. QSL via VK2CCC.

See website: *http://www.qrz.com/db/VK9LL*

3D2GC/p, **Rotuma I**. Stan LZ1GC and Rocky 3D2DD will be on air from Rotuma I, on HF, using CW and SSB. QSL 3D2GC/p via LZ1GC, and 3D2DD/p direct. See website: *http://3d2gc.com/*

Looking ahead to October are the following activations:

CY0P, **Sable I**. Gary VE1RGB, Murray WA4DAN and Rick AI5P plan to be on HF, with a focus on Asia and the Pacific. They plan to have monoband Yagis for 20 – 10 m bands. As the landing on the island is a beach runway, dates are subject to weather conditions. See website: *http://www.cy0dxpedition.com/*

H7H, **Nicaragua**. EA5KM, EA5FX, EA5HPX, EA7FTR, EA1ACP, and EA1DVY will be on air from the station of Octavio YN2N. See website: *http://nicaragua2013.com/*

K9W, **Wake I**. N2TU, K9CT, AA4NN, W8GEX, WB9Z, ND2T, K9NW, K6MM, W8HC, K9CS, W3OA, N4XP. Exact dates to be determined. See website: *http://www.wake2013.org/*

TO2TT, **Mayotte**. I2YSB, IK2CIO, IK2CKR, IK2DIA, IK2HKT, JA3USA, IZ2AXF, 160 – 6 m. See website: *http://www.i2ysb.com/joomla5/*

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Over to you

Measurement fixture for vertical antenna ground system tests

John Morrissey VK3ZRX

A reader has made contact seeking additional information about the measurement fixture I used for the tests on ground systems with a typical short vertical antenna (a squid pole).

Because I used a HP Vector Voltmeter for the measurements, the test fixture is very simple. The HP8405A VVM incorporates a sophisticated RF sampling circuit in the probes themselves, so all the test fixture needed to do was provide a good sample of the current and voltage to the antenna. Also, the HP 8405A probes are high impedance, also making measurement easier (at least at low HF frequencies).

The main design considerations I used were:

- good amplitude response (I wanted at least an octave either side of the test frequency so I could be sure the measurement fixture did not distort results)
- good phase response (ditto)
- convenient scaling factors for the current and voltage.

It's hardly worth drawing a circuit of the test fixture, a description should be sufficient.

I used transformers to sample both voltage and current. To ensure similar phase and amplitude response, the transformers are identical. Each has two windings; one winding is a single turn, the other is 10 turns. Each transformer is wound on an FT50-43 toroid core. Of course 1 turn = one pass through the hole in the centre of the core. I think I used about 0.5mm wire but it is not critical. The 43 mix is suitable for the frequencies envisaged, and achieves reasonably high inductance with relatively few turns (important to keep parasitics low), and getting reasonable inductance was the main reason I used a relatively large core even at the low power levels used for the test. Care was taken that the single turn winding passed through the centre of the hole, and that the 10 turn winding was spread evenly around the core.

The voltage sampling transformer is connected directly across the RF input socket, supplied from the signal generator. The primary is the 10 turn winding connected between input and ground, the output is the single turn winding between ground and the socket for the "voltage" probe (the voltage measurement port). There is no terminating resistor, and the HP 8405A probe is high impedance.

The current sampling transformer is connected with the primary (the single turn winding) between the RF input socket and the output socket to the antenna (the test port). The secondary (the 10 turn winding) is connected between ground and the socket for the "current" probe (the current measurement port). This winding is terminated with a 56 ohm resistor.

With this arrangement, the following scaling applies:

Voltage: the voltage at the voltage monitoring port is 20 dB below the signal at the RF input port. I used nominal +10 dBm input level so the voltage measurement port had a level of -10 dBm.

Current: with a matched 50 ohm load, the current port delivers (nominally) the same voltage as the voltage appearing at the "voltage" measurement port. Note that the current transformer does reduce the voltage on the test port slightly compared to what the "voltage" port sees, so does introduce a small scaling error. This is taken care of with the 56 ohm resistor and the calibration procedure.

As visible in the photo in the article, I enclosed the test fixture in a small Jiffy box with the RF input port and measurement ports along one side, and the test port on the other. The "ground" side of the sockets are connected together with a strip of copper foil to ensure low inductance. Of course a diecast box would do the same thing but isn't really necessary at these frequencies.

Calibration: Because the measurements are relative (ratio of V and I) absolute levels are not important but the ratio and phase difference are important. A full Open-Short-Load calibration could be used if desired, however I settled for a simple Load calibration in the knowledge that the impedances I would be measuring would be reasonably near 50 ohms (very high or very low impedances would require more complete calibration). This was checked with a known good termination resistor (checked with other equipment). The phase calibration was set with the 8405A 'zero' phase adjustment and checked over a range of frequencies.

Then – I was ready to measure! The actual measurement procedure I used was detailed in the article:

- set level to roughly +10 dBm on the signal generator
- vary frequency to find the frequency where phase angle between voltagte and current was zero (ie X = 0), indicating the antenna was in resonance (pure resistance)
- set level at the voltage port to exactly -10 dBm (this step is not essential but reduces later computation)
- read the current level (phase angle is zero with the antenna in resonance).

Current and voltage readings were converted to impedances in a spreadsheet.

I hope this information is helpful.

VK5news

Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

June/July is a busy time for AHARS. We had our regular meeting, the short talks at the 'Shack', a mid-year dinner and a breakfast on the 5th Saturday in June. The breakfast and the auction that followed were very successful. Some money was raised for the family of a deceased estate and a percentage for the club itself. About 50 people enjoyed that day, even though it was a little cold and damp.

The mid-year dinner, held this year at the Bridgewater Inn, was definitely enjoyed if the noise was anything to go by, and the fact that the last people to leave didn't do so till close to 3.00 emphasizes that.

The July meeting was also well attended and enjoyed. It was an evening of 'Show and Tell', when members showed us what they had been making during the year, with explanations.

There seems to have been a number who played with different spectrum analysers or frequency measuring devices. These ranged from one for use in the 2.5 GHz region, made by Lyle VK5WL from a design in 'Silicon Chip' magazine. Lyle told us about the problems he had and the solutions to the problems, as well as showing us the finished project, which looked immaculate. Lyle was delighted to tell members that he had used the drip tray, designed for motor car work, in which to manage his circuit board and the surface mounted components, so the tiny items did not get lost! By contrast Erich VK5HSE sets all his surface mount components in place then lays the circuit on a small heater element. If they are all in the right place they are all soldered simultaneously. He had made a step attenuator and a QRP SMD dummy load.

Jim VK5TR showed us a 'dirt cheap' frequency counter which will most likely become a Club project.

To top off the frequency counters Barry showed us two, a very simple unit that indicated the frequency by the brilliance of a globe when the tuned circuit resonated. The other was from a firm in Melbourne, when he was in Darwin in the 1960s. It arrived in a tea-chest sized crate inside which Barry had to remove four or five cardboard boxes full of shredded paper before he got to the canvas pack (Army Khaki) in which there was a very accurate (and it still is) but large and heavy Bendix. This name will be familiar to the older amateurs but strange to the younger ones. Every shack had a Bendix for frequency checking after WW2, now they are just of historical interest.

Rob VK5RG spoke of the use of Packet and Pactor back before the Internet was so freely available everywhere. Pactor sent and stored messages that could be read later, just like an SMS message can today, using two metres.

Pactor made the same system possible on HF. Many caravan travellers used Pactor for which they could have built a modem not unlike the one Rob showed us that night, and which he had built only recently. He had added a few refinements such as a PTT (digital) switch.

Darryl VK5JDS showed us a device he had bought at one of our November 'Buy and Sell' days. He took it home not knowing what it was. Once he got it to 'talk' he discovered he had a regenerative receiver that worked on all the frequencies from two MHz to 5.1 MHz – with a little very fine tuning. Darryl also showed us a software-defined radio he had put together as inexpensively as possible. He could use it and hear the signals with headphones. This is a project in progress.

Bill VK5DSP showed some of the latest additions to the Cubesat project he had demonstrated at an earlier meeting. He was using a 'Raspberry Pi' circuit board as an experiment. The 'Raspberry Pi' is a small unit through the use of which children can learn to write their own programs, and see them work.

Steve VK5AIM had another of his clever light weight transceivers with an IC-703 that is very suitable for anyone wanting to participate in the Worked All National Parks Award AHARS is sponsoring. He also showed us a simple tester for nine volt batteries, with two standard connectors mounted back to back about two cm apart, with a high value resistor in series with one leg. This allows current to be measured out of the nine volt battery.

To bring in a particular aspect of the current WIA activities, Peter VK3RV spoke about the historical collection that is growing under his care. He noted that one of the biggest tasks is to catalogue what they have so they can fill any gaps that become available from private collections, for example, newsletters and magazines produced by the different states.

Recently a large number of reference books of historical interest were donated to the Institute. These are to be housed in a glass-fronted cabinet so they will be available for researchers for many years to come.

Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

Contests

James Fleming VK4TJF
e *leartez@bigpond.com*

Contest Calendar for September - December 2013

September	7th - 8th	0000 UTC	48 hours	All Asian DX contest	SSB
	7th	0000 UTC	24 hours	Russian 'Radio' WW RTTY contest	RTTY
	14th - 15th	0000 UTC	48 hours	Worked All Europe DX contest	SSB
	28th - 29th	0000 UTC	48 hours	CQ WW RTTY DX contest	RTTY
October	**5th - 6th**	**0800 UTC**	**24 hours**	**Oceania DX contest**	**SSB**
	12th - 13th	**0800 UTC**	**24 hours**	**Oceania DX contest**	**CW**
	19th - 20th	0000 UTC	48 hours	JARTS WW RTTY contest	RTTY
	26th - 27th	0000 UTC	48 hours	CQ WW DX contest	SSB
November	2nd - 3rd	1200 UTC	24 hours	Ukrainian DX contest	CW / SSB
	9th - 10th	0000 UTC	48 hours	WAE DX contest	RTTY
	9th - 10th	0700 UTC	30 hours	Japan International DX contest	SSB
	17th	0000 UTC	24 hours	EPC PSK63 QSO party	PSK63
	24th - 25th	**0100 UTC**	**24 hours**	**Spring VHF/UHF Field Day**	**CW / SSB / FM**
	23rd - 24th	0000 UTC	48 hours	CQ WW DX contest	CW
December	6th - 8th	2200 UTC	42 hours	ARRL 160 metre contest	CW
	14th - 15th	0000 UTC	48 hours	ARRL 10 metre contest	CW / SSB
	21st	0000 UTC	24 hours	OK DX RTTY contest	RTTY
	28th - 29th	0000 UTC	24 hours	RAC Winter contest	CW / SSB

Hello and welcome to another month in contesting. I hope that everyone had fun last month in the IARU HF championships. I did the single operator low power CW section and thus far there are four other Australians that I'm competing against. I'm still filling out my QSL cards from the contest as I write this month's column.

And back by popular demand is the monthly contest calendar, the data of which is gathered from WA7BNM's website. I dare say that he has one of the best websites for your complete contesting calendar needs and this can be found at *http://www.hornucopia.com/contestcal/contestcal.html* However I will still include in this monthly calendar our major Australian contests.

My picks for the month of September are a couple of SSB contests. So get your microphones and equalizers out and your voice callers and vocal cords warmed up for the All Asian DX contest and the Worked all Europe contest.

In the first of these, the All Asian DX, it should not be too difficult to hit up most of the Asian amateurs as they are fairly close. I did notice that in the AA contest that the 80 and 10 metre bands will give you more points. You can compete in single bands and low power as well. A special note here is the exchange, and that is your age although, if you are an XYL, '00' is accepted.

Europe might be more of a challenge, although they will be looking for that rare Australian multiplier. In the WAE contest the exchange is your typical RS plus serial number. There are more points for working the 80 and 40 metre bands. Also of note is that additional points can be achieved by QTCs. A QTC is the report of a contest QSO back to a European station. I found it interesting that they have a club competition and that they offer a trophy so perhaps get your friends together to form a club for this competition.

So that's it for September and hope you do well in contesting this month.

Participate

Shepparton Hamfest	**8 September**
Sunshine Coast Hamfest	**14 September**
Redcliffe REDFEST	**5 October**
Ballarat Hamfest	**20 October**

Winter VHF-UHF Field Day 2013: Results

Contest manager: John Martin VK3KM

Activity in the Winter Field Day was lower than usual. Probably no surprise because every part of the country south of Brisbane had temperatures of 15 degrees or less. However the number of logs is well down from the peak of 73 logs in 2010. Does this indicate a need for some changes? Or perhaps it is reasonable to accept that a mid-winter Field Day will simply not attract the same level of activity as the spring and summer events. Before this event I circulated a paper discussing possible alternative dates, and all of the comments received with the logs indicated support for continuing the winter event and keeping the dates as they are.

Now on to the results. An interesting feature is that the section winners this time are all from VK2 and VK5.

Results Summary

Section	**A**	**B**	**C**	**D**	**E**	**F**
Top scoring stations (all bands)	VK5ZD	VK2DAG	VK5ARG	VK5ARG	VK5AKM	VK2CU
Top scoring stations (vhf-uhf bands only)	VK5ZD	VK2DAG	VK5ARG	VK5ARG	VK3MY	VK2CU
Top Scoring F Call Stations	-	VK3FEZZ	-	-	VK3FJEN	-

Call	**Name**	**Location**	**VHF - UHF Bands**					**Microwave Bands**						**All Band Total**
			50 MHz	144 MHz	432 MHz	1296 MHz	**Sub Total**	2.4 GHz	3.4 GHz	5.7 GHz	10 GHz	24 GHz	47 GHz	
Section A:	**Single Operator, 24 Hours**													
VK5ZD	Iain Crawford	PF94, PF95	49	261	435	624	1369	700	700	700	680	690	-	4839
VK5OQ	Keith Gooley	PF95	36	126	220	192	574	-	220	210	210	-	-	1214
VK3WRE	Ralph Edgar	QF31	-	291	305	360	956	-	-	-	-	-	-	956
Section B:	**Single Operator, 8 Hours**													
VK2DAG	Matt Hetherington	QF57, QF58	79	237	395	632	1343	790	790	790	790	210	790	5503
VK5ZD	Iain Crawford	PF94, PF95	48	180	300	424	952	470	460	470	460	460	-	3272
VK5KK	David Minchin	PF94, PF95	48	138	245	424	855	470	450	460	450	460	-	3145
VK4OE	Doug Friend	QG62	45	183	240	288	756	240	230	-	240	210	-	1676
VK3PY	Chas Gnaccarini	QF22	-	375	380	376	1131	-	-	-	220	-	-	1351
VK3QM	David Learmonth	QF22	-	372	375	376	1173	-	-	-	220	-	-	1343
VK3HY	Gavin Brain	QF22	36	291	410	368	1105	-	-	-	220	-	-	1325
VK5NI	John Ross	PF95	21	108	185	192	506	-	-	210	210	-	-	926
VK2GOM	Rob Greaves	QF56	-	186	185	264	635	-	-	-	-	-	-	635
VK3FEZZ	John Witte	QF22	-	84	120	-	204	-	-	-	-	-	-	204
Section C:	**Multi Operator, 24 Hours**													
VK5ARG	AREG	PF94, PF95	62	303	445	584	1394	230	220	220	210	220	-	2494
VK4WIS	SCARC	QG63	90	363	435	440	1328	-	210	210	210	-	-	1958
VK1MT		QF44	25	279	195	499	998	-	-	-	-	-	-	499
Section D:	**Multi Operator, 8 Hours**													
VK5ARG	AREG	PF94, PF95	47	198	295	376	916	230	220	220	210	220	-	2016
Section E:	**Home Station, 24 Hours**													
VK5AKM	Keith Minchin	PF95	58	183	295	576	1112	690	700	710	320	680	-	4212
VK2GG	Dan Joyce	QF56	21	102	105	168	396	210	210	210	210	210	210	1656
VK3MY	Ross Keogh	QF22	42	486	660	368	1556	-	-	-	-	-	-	1556
VK4KLC	Ron Melton	QG62	66	303	345	472	1186	-	-	-	-	-	-	1186
VK3FJEN	Jenni Blasco	QF21	-	567	605	-	1172	-	-	-	-	-	-	1172
VK5SFA	Steve Adler	PF95	38	258	375	496	1167	-	-	-	-	-	-	1167
VK4VDX	Roland Lang	QG62	60	285	395	416	1156	-	-	-	-	-	-	1156
VK2MER	Kirk Mercer	QF55	-	114	190	272	576	320	-	210	-	-	-	1106

Call	Name	Location	VHF - UHF Bands					Microwave Bands						All
			50 MHz	144 MHz	432 MHz	1296 MHz	**Sub Total**	2.4 GHz	3.4 GHz	5.7 GHz	10 GHz	24 GHz	47 GHz	**Band Total**
VK3AVV	Mike Subocz	QF22	31	423	610	-	1064	-	-	-	-	-	-	1064
VK5MK	Mark Hutchinson	PF94	25	177	220	304	726	-	-	-	-	-	-	726
VK3VL	David Harms	QF33	-	288	230	-	518	-	-	-	-	-	-	518
VK4ADC	Doug Hunter	QG62	59	189	265	-	513	-	-	-	-	-	-	513
VK5HP	Paul Hughes	PF95	-	150	140	168	458	-	-	-	-	-	-	458
VK3APW	Peter Westgarth	QF21	22	180	240	-	442	-	-	-	-	-	-	442
VK2BO	Richard Neilsen	QF56	21	75	160	-	256	-	-	-	-	-	-	256
VK2ZMC	James Cleary	QF56	-	96	160	-	256	-	-	-	-	-	-	256
VK5MLB	Matthew Bonser	PF94	-	75	110	-	185	-	-	-	-	-	-	185
VK3ZHQ	Eric Warren-Smith	QF22	-	165	-	-	165	-	-	-	-	-	-	165
Section F:	**Rover Station, 24 Hours**													
VK2CU	Justin Lavery	QF55, QF56, QF57, QF58, QF67, QF68	90	336	560	896	1882	1120	900	1110	900	420	900	7232
VK5ZT	Tim Dixon	PF84, PF85, PF94, PF95, PF96	71	255	440	744	1510	830	800	810	670	810	-	5430

Check Log

VK4TGL	Gerard Lawler

Notes

VK1MT	VK1MT, VK2ZSZ, VK1XP, VK1HW
VK4WIS	Sunshine Coast Amateur Radio Club: VK4AHW Harvey Wickes, VK4ALH Leicester Hibbert, VK4FAAR Don Hampton, VK4FLDR Lois Reimers, VK4FSCC Glen Campbell, VK4LHD Robert Garland, VK4NFF Spencer Reimers, VK4RY Richard Philp, VK4WT Ches Bassingthwaighte, Dave Carr, May Hampton
VK5ARG	Amateur Radio Experimenters Group: Andrew Hall VK5AKH, Mark Jessop VK5QI

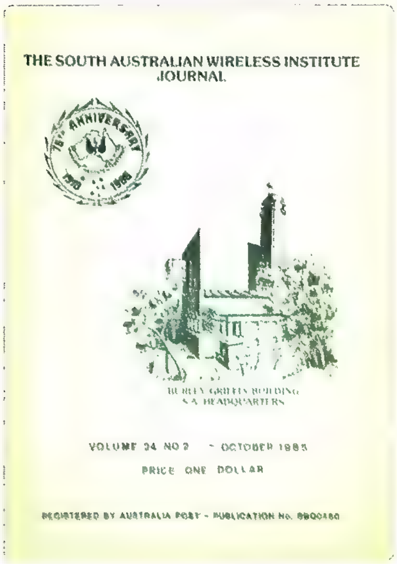
REDFest – 5 October

- Preloved and new goods on sale
- Tables still available @ $10 each
- Entry - $5 – doors open at 9 AM
- Hot food and cold drinks available

St Michael's College, 1-63 The Abbey Place, Caboolture

Enquiries to ***redfest@redcliffferadioclub.org.au***

Hamads



THE SOUTH AUSTRALIAN WIRELESS INSTITUTE JOURNAL

BURLEY GRIFFIN BUILDING
S.A. HEADQUARTERS

VOLUME 24 NO 2 - OCTOBER 1985

PRICE ONE DOLLAR

REGISTERED BY AUSTRALIA POST - PUBLICATION No. [illegible]

WANTED – NATIONAL

Copies of the VK5 Journal

The WIA Archive is particularly interested in locating magazines associated with the Institute in every State or Territory and would like to thank those who recently forwarded copies of the VK5 Journal. We are still seeking a few missing issues for copying and/or adding to the WIA Archive's shelves.

From the volume numbers, it appears that the Journal was published in Adelaide between 1959 and 2000. The format was printed, pages folded A4 (approx size) and stapled. The front cover design varied over the years.

We are particularly interested in locating the following issues:

Vol.20 No.2 1981, Vol.27 No.4 1989, Vol.29 No.2 1991, Vol.35 No1 1997, Vol.35 No.2 1997, Vol.37 No.1 1999 and Vol.37 No.3 1999.

The Archive would also like to locate any other earlier local journals which dealt with experimental or amateur radio in South Australia or claimed to be the official journal of the WIA in SA.

Please contact WIA Historian, Peter VK3RV via email *vk3rv@wia.org.au* or c/o the National Office in Bayswater if you can help us locate any of this material.

FOR SALE – VIC

Yaesu desk microphone MD-100 as new but with transceiver end connector removed, $100. Katsumi EK-26 electronic keyer, clean and works OK $40.

Yaesu FT-101B transceiver S/N 202765 - operates OK but not fully tested or serviced $250.

Contact Noel Ferguson VK3FI, Box 153, Nichols Point, Vic. 3501, or phone 03 5023 6722 or email *vk3fi@wia.org.au*

HP-141T spectrum analyzer (1250 MHz plug-in) S/N 1615A 14456, complete with HP-8444A 0.5-1300 MHz tracking generator, S/N 2325A 06429. In good working condition. I can supply pictures via email if required. $800.00 OBO. Pick-up ONLY.

Please contact Glenn VK3PE at *vk3pe@bigpond.com*

WANTED – VIC

1.8250 MHz crystal for the VK3 160 m AM net. Prefer HC49 size if possible.

Please contact Glenn VK3PE at *vk3pe@bigpond.com*

WANTED – NSW

Central Electronics 100 V or 200 V (yes, even more of a long shot!) transmitter. Preferably in operating condition, but as long as unit is complete, that would be great. I am looking for Central Electronics gear in general.

Contact Steve Beveridge VK2LW on 0412194513 or email on *steve.b@internode.on.net*

Beam antennas, for the two metre and 70 cm bands.

Please contact Malcolm VK2BMS on *vk2bms@bigpond.com* or phone 02 9958 1114.

FOR SALE – QLD

MFJ-1026 Noise Cancelling Signal Enhancer. The unit is in mint condition, fully serviceable, has had very little use and is not modified. See the MFJ catalogue for a full description. $100.

Contact Rod VK4RA QTHR email *rod@opticalfibre.com.au* or mobile 04 0914 1140.

FOR SALE – WA

The VK5JST Aerial Analyser (*AR* May 2006). Over 10,000 built, and still available from the Adelaide Hills Amateur Radio Society. For full details see *http://www.ahars.com.au*

Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $8.00 each (including postage within Australia) to members.

Photostat copies

If back issues are unavailable, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

WIA 2014 Callbook

Available in October

Contributions to Amateur Radio

AR is a forum for WIA members' amateur radio experiments, experiences, opinions and news.

Your contribution and feedback is welcomed.

Guidelines for contributors can be found in the AR section of the WIA website, at http://www.wia.org.au/members/armag/contributing/

Email the Editor:
editor@wia.org.au

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- Submit by **email (MUCH PREFERRED)** or if written and mailed please print carefully and clearly, use upper AND lower case.
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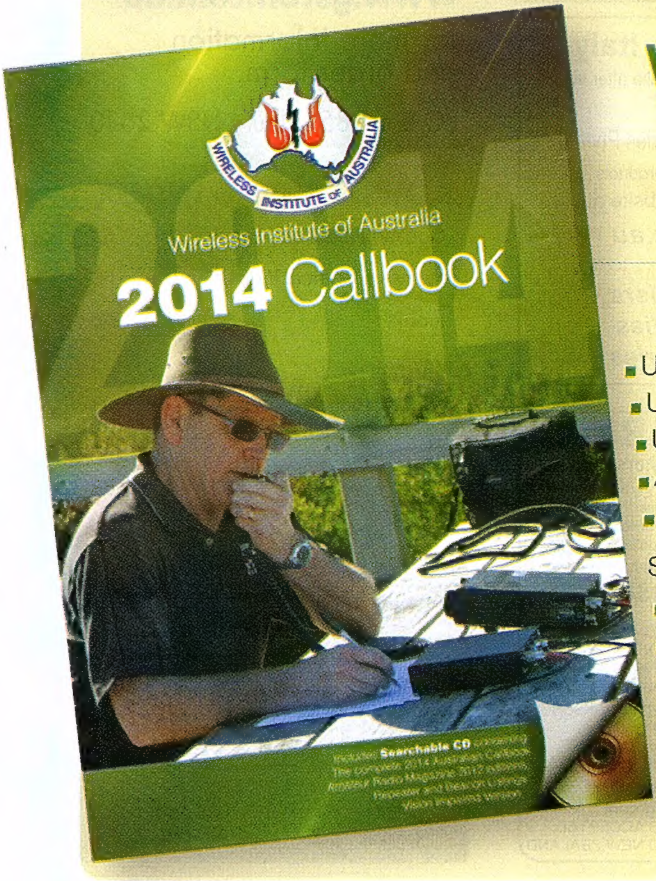

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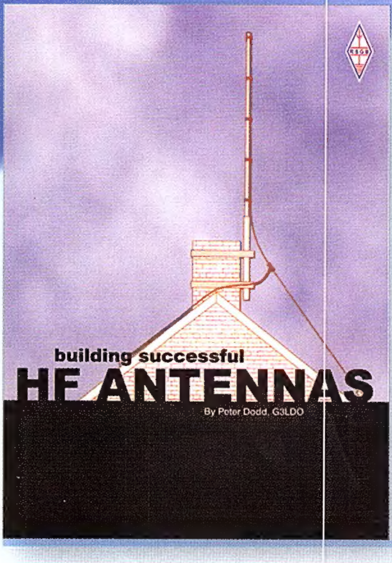

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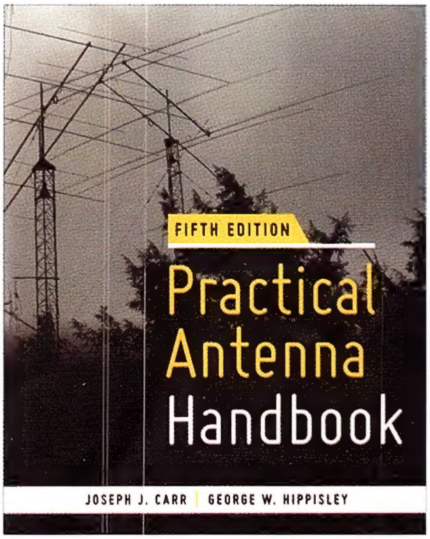

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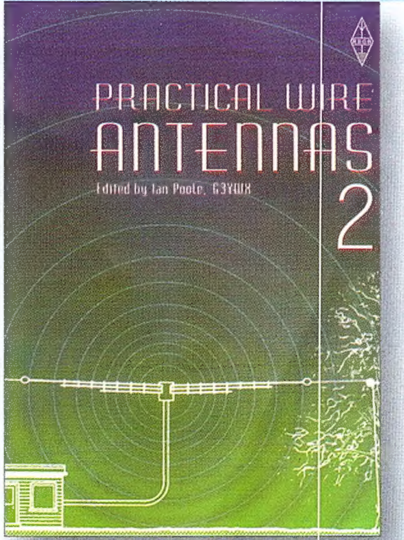

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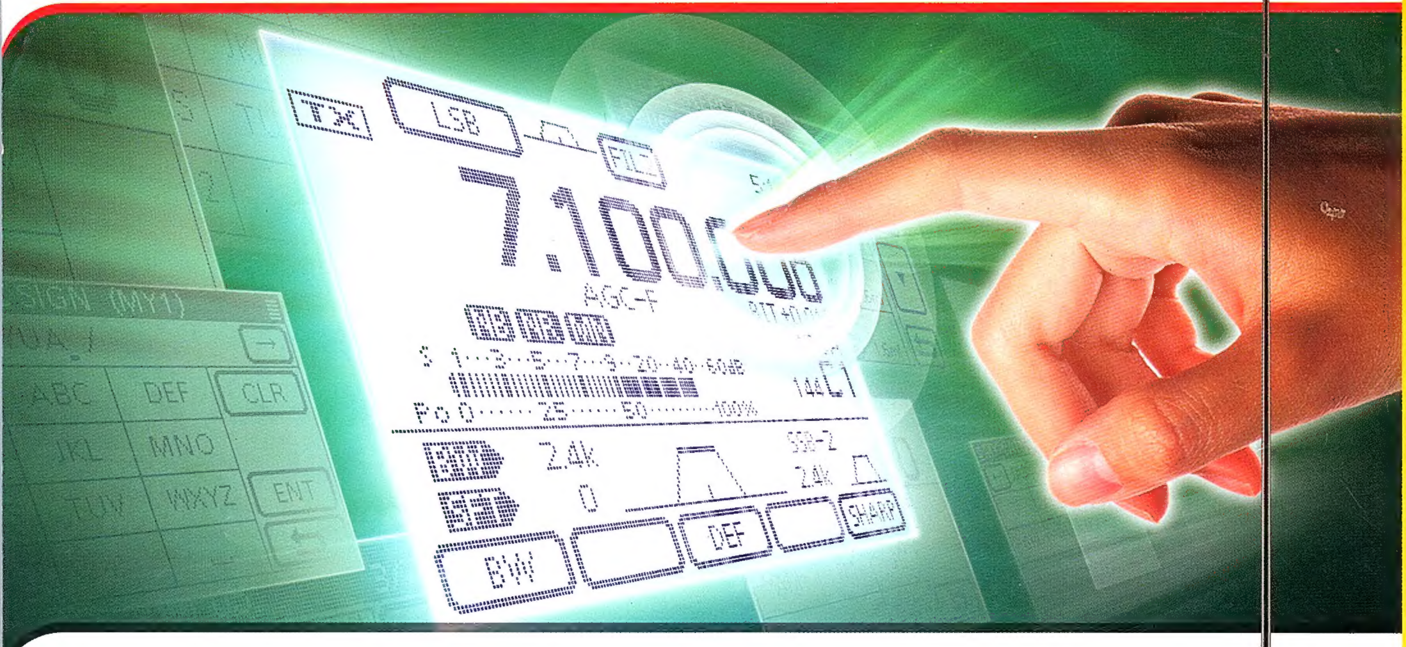

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